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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Possibilities of the Colloid Mill

DURING recent months one of the most-discussed topics in chemical circles has been the Plauson colloid mill and the extraordinary claims which have been put forward in connexion with its ultimate influence on a host of technical operations. As might be expected, reports concerning the possibilities of this comparatively simple little piece of apparatus have been of a somewhat conflicting nature. Little information has appeared in the journals and official technical literature of this country, and reliance for facts has mainly had to be placed on articles appearing in the *Zeitschrift für angewandte Chemie* and the *Chemiker Zeitung*. Appreciating that Dr. Plauson's invention was one which every technical chemist in this country should be in a position to follow up we have made it our business, not merely to give our readers abstracts of foreign literature but to provide them with original and critical information with regard to the developments of the mill—developments which, as they occur, we shall hope to note from time to time. In our issue for December 3

last an article appeared in which some of the more obvious applications of the invention were discussed, and attention was then called to the numerous and far-reaching nature of Plauson's claims. These claims already form the subject of a number of patent applications over here by the Plauson Forschungs Institut, and from them may be gathered some appreciation of the diverse applications of the mill.

In particular we would draw the attention of our readers to the series of two articles (the first instalment of which appears in this issue) which have been specially written for THE CHEMICAL AGE by Dr. S. P. Schotz. Dr. Schotz can certainly be said to write with authority, for he does not rely for his information upon what he has read in German periodicals. We believe we are correct in saying that Dr. Plauson is an acquaintance of his, and that he has been intimately associated with the operation of the colloid mill. Naturally, at this stage an invention of the kind has for obvious reasons to be shrouded in a certain amount of secrecy, so that Dr. Schotz is not at liberty to make public all that he knows. For all that, his articles will be found to contain some striking information, though it is not pretended that the applications of the mill which he deals with by any means exhaust the list. The main feature of the Plauson mill is, as the articles point out, its ability to reduce materials to a size of a hundredth part of a μ , or, in other words, a hundred-thousandth part of a millimetre. To note but one of the many important applications, all kinds of oils can be converted into stable emulsions, and under certain conditions aqueous emulsions of oil form pasty masses, in some cases containing for two parts of oil so much as one to three parts of water. By the addition of certain common compounds the proportion of water can be still further increased, the mixture still retaining its pastiness; but the substances added must be finely divided or colloidal. Accordingly, one obtains a highly valuable lubricating medium the cost of which is but about 40 per cent. of that of lubricants at present employed. This, however, is no more than a mere indication of possible future developments.

Dyestuffs Organisation

QUESTIONS put in the House of Commons this week to the President of the Board of Trade make public information which has been familiar to those possessed of inside knowledge for some time—namely, that negotiations have lately been in progress between British and German dyestuff interests with a view to some understanding. "Negotiations" is perhaps too solemn a term for the occasion; it conveys an idea of responsible diplomatic relations in the Genoa manner. The present "negotiations," we believe, simply amount to exchanges of views on certain

points affecting dyestuff production, and it may safely be assumed that those responsible for them on the British side will know how to safeguard their own interests. Germany is by no means averse to "deals" in this as in other matters, but the usual German terms are quite familiar—they supply the expert direction on the condition that they receive 50 per cent. of the profits and confine the sale of the products to a restricted area. That would hardly do for us. The essence of the British position is self-dependence and complete liberty, and it would be interesting to know what Germany is prepared to do to help its chief competitor into this permanent position. In time, it may be possible to say more on the subject than is advisable at the moment.

The suggestion has been made that German reparations to this country might take the form of recipes and processes for the production of dyestuffs here. No one except outsiders attaches much importance to such a suggestion. These are probably already known or are not very difficult to obtain; what is not so easy to acquire is the working experience which comes with time and which is constantly being added to. As a matter of fact, the chemical side of British dyestuffs production is understood to be probably the least unsatisfactory. Where we are weak is in complete and co-ordinated organisation. What Germany might do, if she were suddenly infected with the principles of the Sermon on the Mount, would be to send over here her best chemists, technologists, and business men for the purpose of organising dyestuffs production on lines as efficient as her own. This would be making a present to us of the results of over forty years' experience, and it would, indeed, be a very handsome form of reparation. But would it be reasonable to expect Germany in this altruistic spirit to put the one competitor that she really fears in a position of equality with herself? And if she is not prepared to do this, what value would detailed bits of information and advice really have? Until a fuller disclosure is made of the nature and limits of the "negotiations" judgment may be suspended. But it is desirable to keep the primary considerations clear of detail.

We see no reason to change the views previously expressed on the general situation. There is, however, a strong feeling in many quarters that direct Government interference in the dyestuffs industry is a hindrance rather than a help. There are smaller concerns which, under competent management, are holding their own on their merits and paying their way. There is no reason why a large concern should not do so also, provided it is managed on sound scientific and commercial lines, and the whole organisation, from the research laboratories to the marketing of the products, brought under efficient unified control. Germany might, if she wished, tell us at once how this could be done. Some, however, have sufficient confidence in British capacity to think we can do it for ourselves if all the interests concerned agree heartily to work together for that end. Germany can have no interest in building up a competitive British industry, and any assistance extorted from her could only have a very limited value.

Standardisation of Filter Presses

It will be within the knowledge of many of our readers that a joint committee of the Association of British Chemical Manufacturers and the British Chemical Plant Manufacturers' Association are drawing up standards for filter-press plates. The final proposals for the standardisation of cast iron filter presses will shortly be presented to the general committee, and on acceptance will be sent forward to the British Engineering Standards Association. The Committee would be glad if those interested, after giving careful attention to this report, will forward any comments as soon as possible to the Secretary of the British Chemical Plant Manufacturers' Association, 166, Piccadilly, London, W.1, so that they may have consideration before final adoption of the proposals.

The sub-committee has now completed its consideration of the replies to the *questionnaire* issued with reference to the original proposals, of which particulars were given in our issue of November 5, 1921. These proposals found a very large measure of acceptance, but some desire was shown for a 48 inch plate, and the committee now puts forward suggestions concerning these, together with certain minor modifications of detail in the original plans. The proposals are the following:—

(a) It has been decided to recommend a recessed plate of the 48 inch size with optional strengthening-bosses.

(b) Only one type of 48 inch plate and frame is submitted, in view of the more restricted range of application of this size. After careful consideration of the conditions to be met in the case of those users who asked for such plates and frames, and also of the probable uses for which they may more commonly be required, it has been decided to adopt a top-feed in an external lug, to be suitable either for cloth sleeves or rubber-joint rings. In regard to the washing arrangements, the view is advanced that having regard to the great capacity of this press, it becomes economical to have a separate wash- and air-outlet to each chamber. This involves the use of an upper trough, but permits the fullest control of washing efficiency. It will be possible to use these wash-outlets and air-cocks as additional filtrate-outlets.

(c) It is proposed to fix dimensions for triangular rubber-joint rings and the grooves to receive them. The dimensions will accord with those of existing rings of this type. Tests are being made to ascertain how rings and grooves to the nearest British dimensions will work together with those constructed for present practice. Full drawings will be sent on application to those who are interested.

(d) In the case of the 32 inch size, it has been found that a working dimension of 31.5 inch is in better accord with the data before the committee, and will work better with existing plates. The size of feed to the plate and frame-press of this size has been increased to 2½ inch.

(e) It is proposed to modify the rim of the central-feed opening in recessed-plate presses to enable the same pattern to be used both for double cloths with sewn centres and for cloth clips. The lip as cast will be half round, and the thickness after tooling

for use with clips is to finish to $\frac{5}{8}$ inch thick for the 18 $\frac{1}{2}$ inch size, $\frac{3}{4}$ inch for the 25 inch and 31 $\frac{1}{2}$ inch sizes, $\frac{7}{8}$ inch for the 38 inch size, and 1 inch for the 48 inch plate. The size of opening and outer diameter of the flange remains as before.

(f) It is proposed to allow the width of rim in all cases to follow the practice of individual makers within stated limits, the size of cake being subject to slight modifications accordingly. The maximum width of rim will be that given in the drawings, and the minimum width will be $\frac{1}{8}$ inch less for the 18 $\frac{1}{2}$ inch size, and $\frac{1}{4}$ inch less for the remaining sizes. The centres of ports in the internal-lug type of press have been slightly modified to make them suitable in all cases. It is decided not to fix dimensions for the rims of frames so long as the latter are made to work together with the standard plates.

(g) In the 38 inch size it is made permissible to fit plates with four strengthening bosses on the filter-surface, to be used only where uneven filling is likely to arise. These bosses are to be arranged on diagonals of the plate, and at 8 in. centres from the vertical and horizontal centre line. A similar arrangement is adopted for the 48 inch plate, except that eight bosses are provided for.

(h) Some minor modifications have been made to the centres of passages for external-lug presses.

(j) Standard identification marks for distinguishing wash-inlet and outlet plates and frames have been settled. These are to be cast on the filtrated (and wash) outlet side of the plates, near the top. Wash-outlet plates are denoted by a single button, and frames by a lozenge placed on the same side as the internal flange, thus denoting its position next to the wash-outlet plate. The wash-inlet plates are plain.

We hope to publish in an early issue the drawings which have been prepared to illustrate the new plates.

Conditions in the Rubber Industry

THE rubber industry has certainly fallen on evil days of late years, and in spite of the efforts made by both producers and manufacturers to ameliorate the conditions the situation still remains serious. The depression in the price of rubber is, as usual, to be attributed to the fact that supply has exceeded demand, and this year it is anticipated that while the output will approximate to some 400,000 tons the consumption will be not more than about 300,000 tons. For the last few years the demand has remained more or less stationary, with the result that considerable surplus stocks have accumulated. There would seem to be only two practicable methods of meeting the situation, namely, the judicious restriction and regulation of output, or the discovery of new applications for rubber which will be of sufficient utility to absorb the surplus. Both of these expedients have received consideration, but the policy of restriction of output proposed by the Rubber Growers' Association was more or less vitiated by the refusal of certain planters to accept the suggestion. Again, the efforts made by the Association to popularise and extend the applications of rubber by the institution of a public competition do not appear to have met with the success which was expected, although considerable hope is

placed upon the development of the use of motor vehicles.

On Saturday last a correspondent of *The Times* had some instructive remarks to make about the dilemma in which the industry finds itself. It was pointed out that the severity of the crisis through which the industry is passing may be measured from the mere fact that the state of affairs has prompted a call on the part of many for Government intervention in the form of compulsory restriction. As mentioned above, voluntary restrictive measures have been tried and have failed. Recent experiences have shown that a scheme of partial restriction is futile, and it is argued that if the option is one between unfettered competition and compulsory restriction, the latter is likely to prove the lesser of two evils. In some quarters there is very strong opposition to the policy of restriction, and some of the big producers maintain that the planting community must recognise that economic forces must ultimately determine the price of rubber, so that in times of stress these economic forces must tend to eliminate the least efficient producers. The problem is one of considerable perplexity, and although the present *impasse* will no doubt tend to solve itself without artificial measures it would seem that it can only be at the expense of the smaller producers.

Points from our News Pages

Dr. Schotz discusses the industrial applications of the Plausen Colloid Mill and points out the important results already attained. The concluding portion of the article will appear next week (p. 790).

The decisions are given of the Railway Rates Advisory Committee in regard to the classification of dangerous goods (p. 797).

Our Scottish Market Report characterises business during the past week as satisfactory with a plenitude of inquiries, both home and export (p. 809).

Business, according to our London Market report, is steadily recovering from the effects of the holidays, and some markets report a satisfactory turnover (p. 807).

The Calendar

June 19	Gas Mantles Inquiry resumed.	London.
19	Optical and Scientific Instruments Inquiry resumed. 11 a.m.	Old Hall, Lincoln's Inn, Chancery Lane, London.
19	Chemists' Exhibition and Drug Trade Mart.	Central Hall, Westminster, London.
to 23	Glass Bottles Inquiry resumed.	London.
20	Institution of Mining Engineers Annual General Meeting.	Cutlers' Hall, Sheffield.
to 22	Society of Glass Technology Ordinary meeting, 2.30 p.m.	Sheffield.
21	Royal Society: Papers by E. F. Armstrong, D. N. Harrison, T. P. Hilditch, C. W. Hinshelwood, S. R. Merton, E. A. Milne, R. C. Ray and G. I. Taylor.	London.
27	Third International Chemical Conference.	Lyons.
July 2	Société de Chimie Industrielle, Second Annual Congress.	Marseilles.
4	Society of Chemical Industry, Annual Meeting.	Glasgow.
8	British Association of Chemists, Special General Meeting. 3 p.m.	Midland Hotel, Manchester.

Industrial Applications of the Colloid Mill*

By S. P. Schotz, D.Sc., F.I.C.

In THE CHEMICAL AGE for December 3rd, 1921, an article appeared which dealt with the immense possibilities which are afforded by the invention and development of the Plauson colloid mill. Below Dr. Schotz, who has been closely associated with the practical operation of Plauson's invention, carries the story further and discusses the utility of the mill in connexion with certain specific operations.

Perfumes and Flavouring Essences

THE solubility of essential oils, esters, etc., in water is very small, and to prepare them for the market in a form suitable for toilet purposes it is necessary to use solvents, such as alcohol and ether, which, beside being expensive, usually possess a smell of their own. This may affect the valuable properties of the material dissolved in them. There are other disadvantages associated with the use of organic solvents. Suppose an essence is required for the manufacture of aerated waters and lemonades. As the percentage of alcohol in these liquids is limited by law, the following problem has to be solved: how is the essence to be made completely miscible with water. The ingenuity of the perfumery chemist is frequently taxed to the utmost in meeting the demands of the mineral water trade.

Now, if it were possible to obtain by simple means permanent aqueous emulsions of essential oils, which would remain unaltered for a prolonged period, and if these could be diluted with water, this difficulty would be surmounted. We should get the original unmixed flavour of the perfume, no volatile inflammable and harmful solvents would be present, and, last but not least, the cost of these essences would be considerably reduced. The preparation of essential oil emulsions on a manufacturing scale has been successfully accomplished by means of Plauson's colloid mill. Oil and water, treated in a special manner, are placed in the mill and beaten for one to three minutes; it is then found that the mixture has been converted into a water-white emulsion, perfectly soluble in water and having all the advantages mentioned above.

This application of the colloid mill has been extended still further in the following direction. If we wanted to obtain the valuable components of a fruit, say an orange, by any of the methods hitherto available we might subject it to hydraulic pressure; there would result a non-homogeneous mixture of orange juice and oil. Moreover, the mixture would contain numerous bacteria and would, therefore, have to be sterilised either by heat or addition of preservatives. Now it is possible to treat oranges in the colloid mill in such a manner that we finally obtain a clear liquid containing an emulsion of the juice and the aromatic oils of orange peel, while all indigestible matter is separated. The "fluid orange" so obtained is certain to be sterile, as will be clear from the following considerations:—

The average bacilli vary from 3 to 6 μ in length and $\frac{1}{2}$ to 1 μ in breadth ($\mu=0.001$ mm.). As the colloid mill is capable of reducing materials to a fineness of 0.01 μ ($\mu=0.001$ mm.), it is clear that bacteria are completely destroyed by passage through the mill. If we consider that this treatment does not injure the vitamins, we realise the high value of "fluid orange." Every component of this perfect food can easily be absorbed by the organism. The commercial possibilities of this process can hardly be overestimated. It is laying the foundation of an entirely new industry.

Homogenised Milk

To obtain milk free from objectionable bacteria is one of the important problems of modern life. The bacteria find

their way into the milk from the cow, the hands of the milker, the air and innumerable vessels with which it comes in contact. Sterilisation by heat destroys most of the vitamins present; therefore, sterilised milk is not a perfect food for children. Children living on such milk only frequently suffer from rickets.

Various brands of dried milk on the market are produced under industrial conditions and are, therefore, less liable to contamination, and being dehydrated at low temperatures retain the important vitamins unaltered. But before the advent of the colloid mill it was not known how to reconvert dried milk into the original condition. Now dried milk is mixed with the calculated quantity of water and beaten in the mill for a short time; a rich creamy liquid is obtained. The fat particles of this "homogenised milk" are of much smaller dimensions than of ordinary fresh milk; therefore, separation of cream is much slower. The milk is sterile as well, for the reasons explained in the previous chapter. Of course, ordinary cow's milk could be treated with advantage in the colloid mill. But here we are in danger of getting mixed up with the question of economics.

Lubricants

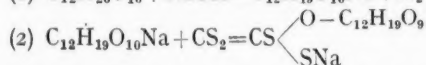
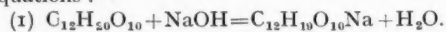
All kinds of oils, such as mineral oil and coal tar distillates, can be converted into stable emulsions. What is still more remarkable, it has been found that under certain conditions aqueous emulsions of oil formed pasty masses. Some of these pastes contained for two parts of oil as much as one to three parts of water. By adding barium carbonate, magnesium carbonate, magnesium oxide, etc., the percentage of water can be increased still further, and still the lubricant will remain pasty. It is essential that the substances added should be finely divided or colloidal. Graphite, talcum, etc., can be likewise incorporated, forming a homogeneous stable paste which possesses valuable lubricating properties and is completely neutral; no addition of soaps is necessary. The colloidal pastes have been found to be more stable than liquid emulsions.

The following are some of the advantages which can be claimed on their behalf:—They cool the bearings to which they are applied, owing to the high specific heat of water, and are very suitable for cylinders of internal combustion engines, as the presence of water reduces the temperature of explosion and protects the lubricant from burning. Owing to the absence of alkali, there is no erosion of the cylinders by mineral matter. It has been estimated that by choosing suitable proportions of oil and water a saving of lubricant up to 60 per cent. could be effected. Consequently the chemist has now the power of altering the consistency of a lubricant without altering temperature and without adding solvents other than water, the cheapest of all. Further, it is easy to see that the price of lubricants is reduced by half, that one is not limited to a definite material, but as properties of the final product will depend largely on the proportion of water and added colloidal matter, it will be possible to use the cheapest materials available at the time. These are merely indications of future developments.

* Hermann Plauson, *Chem. Zeit.*, 1920, 90, 553-555; 92, 565-567. B. Block, *Zeitschr. Angew. Chem.*, 1921, 7, 25-30. J. H. Frydlander, *Revue des Prod. Chim.*, No. 6, March 31, 1921, 173; No. 23, December 15, 1921, 731. Several other articles and innumerable patents, English and foreign.

Viscose

Theoretically, to obtain a solution of viscose it is necessary to treat cellulose with caustic soda to form sodium-cellulose. This is acted upon by the calculated quantity of carbon bisulphide. The process can be expressed by the following equations:—



(For convenience the molecular weight of cellulose has been represented as above.)

In practice, however, this cannot be carried out so simply. To convert cellulose into its sodium derivative direct a large excess of caustic soda is required, otherwise a portion of cellulose remains unchanged. But when using excess of caustic soda it is impossible to avoid the formation of a large proportion of the disodium derivative, which is less suitable for the manufacture of Viscose. The best way of getting over the numerous difficulties of the process was found in a preliminary treatment of cellulose with dilute acid at elevated temperatures.

This treatment with acids gives a cellulose which can be converted into a mono-sodium-xanthogenate, but, at the same time, the product so obtained contains considerable quantities of degradation products of cellulose, various sulphur compounds, such as sodium monothiocarbonate and esters of dithiocarbonic acid. Naturally, all this helps to produce a Viscose, which is not all one would desire. At the same time, as the reaction is so straightforward, it must be possible to find some simple method to overcome the various difficulties of this process.

According to Dr. Plauson it can be accomplished in the following manner:—Cellulose is mixed with the theoretical quantity of aqueous caustic soda and ground in his mill until a colloidal solution is obtained. In that state cellulose easily forms a mono-sodium derivative. On adding carbon bisulphide to the sodium-cellulose while in the mill sodium-cellulose-xanthogenate is easily produced. The writer thinks that it is not merely the colloidal state of cellulose that makes it enter easily into reactions, but also the hydration which is brought about in the process of grinding in the presence of water. Perhaps it will not be out of place to make here a few general observations. No invention originates spontaneously; general progress of science is necessary to make it possible; industry must be sufficiently advanced, if not to take up the invention immediately, yet to foresee its application. General education must be on such a level that the inventor may expect sufficient appreciation. That is not all: a great deal of scientific spade work of predecessors is required to enable the inventor to combine the gist of it into a single successful idea. Of course, this does not diminish the value of inventions.

These observations apply very well to Dr. Plauson's discovery of colloidalisation of cellulose. The researches of Cross and Bevan (who, by the way, discovered Viscose), and others in England, laid the foundation to this invention. How near it some were will be seen from the following paragraph:—

"Mr. H. Jackson, of Garstang, Lancashire, papermaker, adopting fundamental views of his raw materials as colloids, and of colloidal quality that is a variable to be controlled and is measured by hydration capacity, has invented a beating engine designed especially to give maximum hydration effects in minimum time. The mechanical principle of the new beater is a 'wet hammering' of the fibres, effected by actual hammers operating centrifugally, so that the force of the blows will vary with the speed of rotation."*

* Lectures on Cellulose, by C. F. Cross, published by the Institute of Chemistry, 1912.

Some Advantages of the Process

Let us return to the subject of Viscose, and see what advantages can be claimed by the new process:—

1. It is possible to effect the reaction at ordinary temperature by the use of not more than the theoretical quantity of caustic soda.

2. The duration of the reaction is considerably reduced, so that there is far less risk of the cellulose being injured by alkali.

3. The formation of cellulose-xanthogenate proceeds smoothly when carbon bisulphide is added. No sodium sulphide, esters of dithiocarbonic acid and other injurious thiocompounds are formed as is said to be the case in older methods of manufacture.

4. A pure solution of Viscose is obtained, which when filtered is perfectly limpid, and can, therefore, be used for all kind of manufactures.

5. The cost of production is considerably reduced.

6. The tensile strength and durability are increased and the material takes dyes much easier than Viscose produced by other methods; and

7. For the production of artificial silk the maturing of Viscose obtained by this method can be reduced to a matter of a few hours only, whilst for most other purposes it is quite superfluous.

In speaking of Viscose, we have dealt with improvements produced by applying the Colloid Mill to an established technical process.

Two questions are fairly obvious: Suppose we merely colloidalise cellulose or even wood—(1) Could this be accomplished with less caustic soda or without any whatever; and (2) could the colloidalised cellulose be used direct? That this is possible has been proved by Dr. Plauson, who has stated that "in the presence of small quantities of caustic alkali (0.5 to 1 per cent.) a perfectly soluble sol was obtained. In absence of alkali there was formed a very fine gel-like dispersion of pine-sawdust, which settled slowly; the supernatant liquid was colourless and opalescent, and contained about 2 to 3 per cent. of solid." The addition of acids or salts to this solution precipitates the cellulose, which, after drying, can be pressed into a perfectly homogeneous mass. The substance obtained in this manner (in reality a solid Viscose or ebonite substitute) can be used as a material for the manufacture of various kinds of articles."

B. Block (*La Revue des Produits Chimiques*, No. 6, 31/3/21, and elsewhere; also French App. 18,228 of 4/12/20) gives the following description of the actual manufacturing operations: To reduce the work of the Colloid Mill, the sawdust is previously ground in a ball mill. The finest particles are driven by means of a fan into a collecting chamber, and from there carried away by the current of air and collected in water, while the larger particles are automatically returned to the mill. The mixture is transferred to two tanks provided with stirring gear. If necessary, to the fine sawdust are added certain substances—e.g., resins and alkali—which facilitate dispersion, colouring matter, etc. The mass is finally transferred to the Colloid Mill. When the desired consistency has been attained, the colloidal liquid is pumped into a tank, in which the colloid is deprived of its electric charge by means of acids and so coagulated. The gel must be freed from acid by neutralisation, then freed from the salts and, finally, filtered either by means of a vacuum filter or centrifuges or by means of Plauson's filterpress. The colloid is washed on the filter, separated from water as far as possible, and dried in vacuo. Vacuum drying is necessary. If the substance is dried in presence of air, it is, on the one hand, damaged by the atmospheric oxygen; on the other hand, it is impossible to remove moisture from the cellulose, which in this state is strongly hygroscopic. As the material is pressed while hot into buttons, etc.,

the presence of moisture would produce bubbles; therefore, even the preservation of the cellulose must be carried out in vacuo, so as to avoid absorption of moisture. For the production of buttons it is sufficient to colloidise only 30 per cent. of the cellulose used. Buttons prepared by this method show a uniform fracture, and are so tough that special tools are necessary to drill holes, polish them, etc.

The tensile strength of the material is about 300-500 kg. per sq. cm.—i.e., 5 to 10 times greater than that of wood. It has a specific gravity of 1.2. Its dielectric strength is such that 55,000 volts cannot pierce a plate of colloidal cellulose 3.5 mm. in thickness. Boiling for days at a time and lying under water does not alter this great power of resistance. This substance would be an excellent material for the manufacture of parts of electrical apparatus and machinery. Moreover, it is free from sulphur and chlorine, and their compounds, therefore, can under no circumstances give rise to corrosion of metallic parts with which it is in contact.

Reviews

METALLOGRAPHY. By C. H. DESCH. London: Longmans, Green & Co. Pp. 440. 18s.

This is a third and revised edition of a well-known work, first issued in 1910. The author is well known as an omnivorous reader and an accepted authority on the subject with which he deals. The earlier editions of this book have been largely used as text-books in universities and schools, and for reference in technical laboratories. The present edition, which contains 14 plates and 105 diagrams in the text, is very slightly larger than the previous issue. The most important changes are in portions dealing with the physical properties of alloys, corrosion, and the metallography of iron and steel. Some reference to modern knowledge on crystal structure, and its relationship to physical properties, might have been added with advantage.

The composition of alloys is frequently given in atoms per cent., and we confess we do not see any advantage in this method. In practice alloys are always made by weight, and conversion from atoms involves troublesome calculations. If intermetallic compounds are indicated, on other grounds, it is quite easy to find the atomic relationship. If any other composition is required, beyond that of percentage weight and specific volume, perhaps it might be found in the percentage number and volume of the atoms in an alloy, so as to assist in forming a picture of the space lattice.

In some cases the revision has not been complete, as on p. 11, where Bornemann's work is stated to be in course of preparation; in certain other cases recent work has been omitted. Some oversights are inevitable in revising a standard work, and the new edition will be welcomed by all who are interested in a subject which has in recent years assumed such theoretical and practical importance.

T. T.

THE CHEMISTRY OF THE NON-BENZENOID HYDROCARBONS AND THEIR SIMPLE DERIVATIVES. By BENJAMIN T. BROOKS, Ph.D. New York: Chemical Catalog Co. 1922. Pp. 612. \$7.

The present volume is a somewhat specialised treatise dealing with the hydrocarbons, their preparation, properties and certain derivatives, exclusive of the aromatic series and also, for some unexplained reason, of the acetylene hydrocarbons—in short, it is a treatise on the paraffins,

olefines, cyclo-paraffins, and what may be termed the cyclo-olefines. For the author rightly criticises and rejects the term hydroaromatic hydrocarbons applied to the two latter groups, for, as he says, they are actually much more closely allied to the paraffins and olefines.

In spite of the statement in the preface that the benzene hydrocarbons are omitted because they overshadow the others, the latter have not been neglected by chemists, to judge by the 600 well-filled large octavo pages on the subject. Whilst the earlier pioneer work on petroleum, such as that of Schorlemmer and Warren, is not referred to, the later researches on this group of hydrocarbons are brought up to date and the author has collected a considerable amount of useful practical information on the action of heat, on combustion, oxidation and chlorination of the paraffins, much of which, more especially the "cracking" process and the conversion of paraffins into fatty acids, is of technical value.

The chapter on the paraffins is followed by one of a theoretical character on the nature of the ethylene bond, which introduces another on the unsaturated hydrocarbons together with their products of polymerisation, including an account of synthetic rubber.

Seven chapters are devoted to the cyclo-paraffins and what is sometimes termed the terpene and camphor group of compounds, for it should be pointed out that the author does not confine himself exclusively to the hydrocarbons. The treatment of these chapters is very much on the lines of that of the ordinary advanced text-book, and the only incident of technical interest is an account of synthetic camphor.

This is followed by an account of intramolecular change or rearrangement, containing the recent work of Tiffeneau and Meerwein on the pinacine-pinacoline conversion, and there are short final chapters on the physical and also physiological properties of the hydrocarbons.

The author makes use of words, such as *pyrolysis*, and spellings, such as *paraffine* and *pelletierin*, which are unfamiliar to English readers, who are accustomed to regard the termination *ine* as the special adjunct of organic bases. Hofmann is spelt with two n's, and it may be added that he, and not von Braun, is the author of the process known as "exhaustive methylation," which was introduced by him many years ago in the investigation of alkaloids.

There is a curious and inexplicable error in the reference on p. 525 to the J.C.S. 1910, I., 838, which should be J.C.S. Abstracts 1903, I., 403. It is clear that the author has not followed the old adage "verify your reference," which in this case has a flavour of being borrowed.

J. B. C.

DISTILLATION PRINCIPLES AND PROCESSES. By SYDNEY YOUNG, M.A., D.Sc., F.R.S., with the collaboration of Lieut.-Col. E. BRIGGS, D.S.O., B.Sc.; T. HOWARD BUTLER, Ph.D., M.Sc., F.I.C.; THOS. H. DURRANS, M.Sc., F.I.C.; The Hon. F. R. HENLEY, M.A., F.I.C.; JAMES KEWLEY, M.A., F.I.C.; JOSEPH REILLY, M.A., D.Sc., F.R.C.Sc.I., F.I.C. London: Macmillan and Co., Ltd. Pp. xiii, 509.

Almost twenty years have elapsed since the publication of Dr. Young's *Fractional Distillation*, and this, the second edition, maintains the position held by the former, namely, that of the most exhaustive book in the English language concerning the principles of distillation. For some years past it has been difficult to purchase or even to borrow a copy of the first edition, the one copy in the Chemical Society Library being retained in the reference section, and the new edition will therefore receive a warm welcome from the many chemists and engineers interested in distillation processes.

The contents have been divided into two approximately equal divisions, the former representing the revised first edition, and the latter being an entirely fresh addition dealing with industrial distillation processes. The first division has been brought up to date by the incorporation of material selected from over one hundred original papers published since 1904. A chapter also has been added dealing with sublimation. This, from the point of view of many technical men in various industries, probably will prove the least satisfying as regards the provision of physical data.

The remainder of the book—a little more than half—deals with the details and practice of distillation in the following industrial applications—Acetone and n-butyl alcohol, alcohol, petroleum, coal-tar, glycerine and essential oils. These sections have been written by collaborators whose names are well-known in the respective branches of chemical industry. A study of these sections illustrates the marked absence of chemical engineering data in some branches. For instance, in the sections on acetone and alcohol full data relating to the fractional distillation of these products are given; while in the section on coal-tar the text comprises only a general description of plant and methods with the addition of but few figures that lend themselves to use in the scientific design of suitable plant. It is true that the author of the section, "Fractional Distillation in the Coal Tar Industry," has undertaken a difficult task in endeavouring to give in 62 pages a general outline of the coal-tar industry as well as a description of the distillation of the various products which involve a number of different types of plant. On page 362 of this section the term "low-temperature carbonisation" is not used in its present-day sense; and in paragraph 4 on the same page "density of the charge" should be referred to as a factor bearing on the nature of the tar produced. The paragraph on carburetted water-gas tar on page 364 requires revision. The typography is all that can be desired. F. M. P.

FLUIDITY AND PLASTICITY. By EUGENE C. BINGHAM. First Edition. New York: McGraw Hill Book Co.

In producing an up-to-date book on these subjects the author is fully justified. The work fills a gap in scientific literature, in that it deals, in a very lucid manner, with a collection of hitherto widely diffused information. The discussion of viscosity, which occupies the first part of the book, will be appreciated, since it is given but meagre attention in the majority of physical chemistry textbooks. The expansion of knowledge on such subjects as colloids and the properties of diffusion, conductivity, ionic migration and the rates of solution, association and crystallisation is largely dependent upon, and will coincide with, the extension of our knowledge of viscosity and fluidity, etc. The work will be of interest and value, not only to the chemist, but also to the engineer and physicist and, to a lesser extent, to the medical and allied professions.

Many imperfectly understood and neglected phenomena concerning plastic and viscous flow, etc., are shown to be capable of correlation, and receive clear and extensive treatment; and the information set forth should prove of considerable value in the diagnosis and treatment of many more or less obscure industrial difficulties. The bibliography and author index is excellent and comprehensive, and adds to the undoubted value of the book.

A. A. P.

NOTES ON QUALITATIVE ANALYSIS. SUPPLEMENT. By H. J. H. FENTON, Sc.D., F.R.S., F.I.C., F.C.S. Cambridge University Press. 1922. Pp. 202. 3s. 6d.

In this Supplement to Fenton's *Notes on Qualitative Analysis* Dr. Fenton describes the reactions and properties

by which most of the rarer elements may be identified. The opportunity has also been taken to deal with a considerable number of organic and inorganic compounds not mentioned in his earlier *Notes*, the selection of compounds being quite arbitrary but restricted mainly to substances of some commercial importance. The Supplement concludes with a short list of the solubilities of the principal reagents used in qualitative analysis. In the list of solubilities the author gives the strengths of the various solutions which may be regarded as suitable for qualitative analytical work in general. He rightly points out that a novice usually has no idea of the actual quantities of the reagents he employs, and commonly uses quantities enormously in excess of those required.

Although these *Notes* are apparently intended primarily for the use of teachers in universities they will be welcomed by a large number of chemists and students of chemistry who have little acquaintance with the rare elements and their compounds and yet have occasion, from time to time, to seek information concerning the reactions by which they may be identified and separated.

The information given concerning some of the organic compounds, such as amidol, aspirin, and veronal is scanty, but so far as they go all the *Notes* are useful, clear, and concise, and will be helpful to those who are unable or unwilling to study the more exhaustive books on the subjects discussed. H. F. H.

FOOD VALUES: WHAT THEY ARE, AND HOW TO CALCULATE THEM. By MARGARET MCKILLOP, M.A. London: Routledge and Sons. Pp. 171. 3s. 6d.

This book is an accurate compilation of up-to-date information on food values and standard dietaries. It contains much sound advice on these matters, and will be useful to teachers of cookery and to those responsible for the menus of schools and institutions. It is to be feared, however, that the considerable mass of detail in the book, valuable though it is, will be confusing to the "modern" housekeeper.

There are minor misprints in the book, but very few errors of importance. Some analyses quoted from Hutchison on page 63 are incorrectly reproduced; the percentages of nitrogenous matter in gelatin and isinglass being 84.2 and 77.4 respectively, and the calories per pound 1,570 and 1,510, instead of as stated. American sources have been largely drawn on for the figures given, but the comprehensive tables of analyses and energy values of foods published by Plimmer in 1921 are not mentioned.

It is to be hoped that in any future edition of this work the matter included in the notes on chapters 2, 4 and 6 will be incorporated in the text. The table of contents contains no reference to the existence of these notes, which occupy 35 pages. The practice adopted by the author of referring the reader to "the tables," without reference to the pages on which they are to be found, is somewhat objectionable in a work consisting very largely of tables.

The statement as to the composition of milk (page 67) is inaccurate, and appears to refer to some American standard. Cows' milk sold in this country is required to contain 3 per cent. of fat and 8.5 per cent. of other solids, not 3.4 per cent. fat and 12 per cent. total solids. The book, however, is on the whole a reliable guide, and can be recommended to those for whom it is primarily intended. A. R. T.

Further Safeguarding Act Complaint

THE Board of Trade have received a formal notice of complaint under Section 1, Sub-section (5), of the Safeguarding of Industries Act, that R. Sodium hyposulphite has been improperly included in the lists of articles chargeable with duty, and the complaint will be submitted in due course to the Referee.

Safeguarding of Industries Act: Part II

Second Inquiry Regarding Gas Mantles

A COMPLAINT by the Incandescent Mantle Manufacturers' Association that mantles for incandescent lighting manufactured in Germany are being sold or offered for sale in the United Kingdom at prices which, by reason of the depreciation of German currency in relation to sterling, are below the prices at which similar goods can be profitably manufactured in this country, and that by reason thereof employment in the mantle industry in the United Kingdom is being or is likely to be seriously affected, was considered on Thursday, June 8, by a Committee appointed by the Board of Trade under Part II of the Safeguarding of Industries Act. The Committee consists of Sir Bernard Mallet (chairman), Mr. J. Arthur Aiton, Sir John N. Barran, Mr. G. A. Moore, and Mr. Arthur Pugh. The complainants desire that a duty of 33½ per cent. should be imposed upon incandescent mantles imported from Germany.

The complainants were represented by Mr. J. P. H. Soper (managing director of Monarch Mantles, Ltd., and vice-chairman of the Joint Industrial Council for the industry). Mr. Kenneth Swan represented a number of importers of gas mantles—namely, the New Inverted Incandescent Gas Lamp Co., Ltd. (London); E. A. Wood (Birmingham); Albert Lee and Co., Ltd. (London); Lotz, Abbott and Co., Ltd. (London); George Hands and Co. (London); the Anglo-Continental Lighting Co. (Leeds); Direct Supply Co. (Leeds), Ltd.; Reddan and Bewley (Liverpool); and the Bon Accord Incandescent Lighting Co. (Aberdeen). He said he believed the German manufacturers desired to appear, and probably at the next hearing he would also be representing the German Convention of Gas Mantle Manufacturers. Mr. Sholto S. Ogilvie, joint manager of the National Gas Council, appeared in opposition to the complaint on behalf of the Council.

Case for the Complainants

Mr. SOPER, opening the case for the complainants, pointed out the national importance of the incandescent mantle manufacturing industry. During the war, he said, a committee presided over by Lord Balfour of Burleigh had reported on certain essential industries, and the manufacture of gas mantles the committee found to be an industry of great importance, especially in respect of efficient illumination and the conservation of coal supplies. The alteration of the gas standard from illuminating power to heat value was due solely to the invention and development of the gas mantle, and he submitted that it was essential that there should be maintained in this country a healthy manufacture of gas mantles.

Mr. Soper dealt in detail with the method of manufacture of both inverted and upright incandescent gas mantles and emphasised the large number of processes and the variety of raw materials used, as well as the large amount of labour involved both in the manufacture of mantles and in the preparation of raw materials. Nitrate of thorium produced from monazite sand was used to a large extent in the manufacture. Before the war there was no manufacture of nitrate of thorium from this source in this country, but now there were factories which could produce the whole of the thorium used in this country and more. Besides being dependent upon Germany before the war for the whole of the nitrate of thorium used for gas mantles, manufacturers here were also dependent upon that country for a very large quantity of their nitrate of cerium, and practically the whole of the asbestos, but now everything that is required for the manufacture of mantles used in this country could be produced here. Therefore, the British industry was self-supporting, not only for the finished mantles, but for the whole of the raw materials used.

With regard to costs of production on the Continent and in this country, Mr. Soper said that evidence would be given confidentially. Two factories in this country before the war were controlled by German concerns, and they were worked on continental methods. Evidence would be given to show that there was no appreciable difference between the methods of manufacture adopted in those factories and in the factories which had never had German associations. If British manufacturers to-day were buying materials at the prices at which

the Germans were buying, if they were paying rates of wages equivalent to those paid by the Germans, and were subject to what they believed to be German overhead charges, they could produce mantles in their factories at the present time at 1,100 marks per gross, which was something under £1, taking the rate of exchange at 1,200. If the Committee could be satisfied of that, then the complainants would have substantiated that their methods of manufacture were efficient and economical, and that the difficulties which the British manufacturers experienced at the present time, owing to German competition, were due solely to the depreciation of the mark.

Mr. Soper's Evidence

Mr. SOPER then gave formal evidence in support of the complaint. The Incandescent Mantle Manufacturers' Association, he said, consisted of the principal manufacturers in this country, and the members produced collectively in their factories about 95 per cent. of the mantles manufactured here. The total capital employed was about 1½ millions sterling, and, in addition, the members had invested some £350,000 in subsidiary industries. Discussing the efforts of the Germans to secure a monopoly in the supply of various raw materials for the manufacture of mantles before the war, witness said that in 1914 the German manufacturers of thorium and mantles made a move to establish an international convention regulating the supply and prices of gas mantles. The British manufacturers were summoned to a meeting at which a scheme was placed before them based on the following principles: (1) The production of each factory, here and abroad, was to be limited to the number produced in the preceding year; (2) any factory making and selling more than its fixed production would be fined, and a substantial part of the profits paid into a pool; (3) the selling prices in each country would be fixed by the Convention and controlled from Berlin; (4) all disputes to be settled in Berlin according to German law. Similar meetings were held in other countries, and it was intimated that any firm not agreeing to the scheme could no longer rely upon a supply of thorium nitrate, which would have been tantamount to closing it down. The war, however, had put a stop to the development of the scheme.

During the war, developments in this country resulted in British mantle manufacturers being able to obtain all their raw materials in the country. After the Sankey judgment, however, mantles came into this country from Germany and imports increased very considerably. In 1920 Germany exported to this country 21,359 gross of mantles, valued at £51,710, the average price being 48s. 5d. In 1921, 63,756 gross were exported to this country, the value being £111,917, and the average price 35s. 1d. In the first quarter of 1922 the quantity was 36,153 gross, the value £55,707, and the average price 30s. 9d. The actual cost of a finished mantle was made up of wages, direct and indirect, to a greater extent than almost any other article of commerce, so that the low wages in Germany had a direct effect on the difference in price between the British and German mantles, a difference which constituted a very severe handicap to the British industry.

Production Costs and Selling Prices

Certified figures of costs of production at three of the principal factories in this country would be given confidentially. It was believed that the German prices for this country were fixed so that they fell a little below current British prices. The internal price of mantles in Germany was fixed in March last at 9 marks (subject to wholesale rebates), which was equal to about 21s. per gross with the exchange at 1,200. This was an increase on previous prices, but, in order to meet the lower prices announced in March by the British manufacturers, a reduction was made in the export price to Great Britain. In February the official German Convention price was 43s. 2½d. per gross, but at present it was 31s. 6d. For export to the United States, where there was a duty, the price was 22s. 8d. per gross, with a discount of 10 per cent. to the German exporting house. There was a considerable difference between the average prices shown on the Customs entries and the official German Convention prices, for the reason that the majority of German exporters were always prepared to evade

the Convention prices. Instances of this were given. Witness stated that during the first quarter of 1922, 28 per cent. of the total imports were declared at values of 22s. 6d. and under. It could be reasonably inferred, therefore, that the prices charged by German manufacturers in this country still left a very large margin for reduction and that the imposition of a duty would be met by a reduction in price. If this course were pursued, such reduced prices, plus the import duty, would still permit of German mantles being sold in this country at prices which would be competitive with those at which mantles could be manufactured and sold here. The real effect of the duty would be that the sale of German mantles would not be so remunerative or such an attractive proposition for the importers as at present. The more equal conditions would, in all probability, divert a substantial amount of business to the British factories, resulting in a reduction of their overhead charges from increased turnover.

Wages in this country were regulated by the Joint Industrial Council. At present the rates were 7d. an hour time rate, and 8½d. an hour piece-work rate, for women over 18 years. About 95 per cent. of the workers in the industry were women. Before the war the average rate of wages was 4d. an hour for time and piece work. It was the opinion of the witness that the falling off of orders which had been experienced by the British manufacturers was due to price, and nothing else, and had resulted in progressive unemployment in the British industry. Between the end of 1919 and the end of 1921 nearly one-third of the workers had been displaced, and those remaining are only working 75 per cent. of the normal working week. During 1922 the position had got worse, and involved a large increase of unemployment in the subsidiary industries. Order books at the present time were practically empty, for both present and future deliveries, whereas advance bookings to deal with the autumn and winter trade had, in previous years, been a feature of the trade. As evidence of the efforts which had been made to keep the trade going, the witness said that for last season a special mantle was put on the market at a price below the cost of production; the price was 5½d. For next season trade prices of British mantles had been substantially reduced all round, and a rebate scheme was being offered to members of the trade who would stock and sell only British made mantles. The scheme, however, would result in a loss, unless increased turnover resulted.

Discussing the recent decision of the Referee under Part I of the Act, Sir John Barran said they did not know yet whether the words "mechanical aggregates of oxides of thorium and cerium" were interpreted as meaning the substance pure and simple or the substance after labour had been put into it in the various processes.

Mr. SOPER said the Referee had indicated one method of taxing, and that was the value of the mantle, deducting, in the case of the inverted mantle, the value of the ring, and, in the case of the upright mantle, the value of the asbestos. If that interpretation were adopted, the duty under Part I would be substantial, amounting, perhaps, to 30 per cent. of the value. If, on the other hand, the duty were taken to mean the ash value of the mantle—i.e., the value of the thorium and cerium as ash, and not as a mantle—then it would be much smaller.

Mr. AITON asked whether the Mantle Manufacturers' Association regulated prices.

Mr. SOPER said they did not, but some manufacturers had a price agreement amongst themselves. The larger manufacturers were inside the agreement, but he assured the Committee that the prices fixed were not monopoly prices.

Replying to a question by Mr. Moore (a member of the Committee), the witness said that if the decision of the Referee under Part I were held to apply to the burned-out mantle, the duty chargeable would not be sufficient to enable the industry to go on.

Mr. C. S. Garland

Mr. C. S. GARLAND, B.Sc. (Managing Director of Lighting Trades, Ltd.), who has had a long experience of gas mantle manufacture, said he had inspected incandescent mantle factories in Germany, France, Canada and the U.S.A., and had examined and tested incandescent mantles from all the principal factories of the world. He went into the history of the gas mantle in some detail, to show that although the principal invention was made by an Austrian, Baron Auer von Welsbach, the commercial development proceeded at a

greater rate in England and America than on the Continent. It was only after the Germans gained control of an essential raw material, namely, monazite sand, from which nitrates of thorium and cerium were obtained, that the German became the chief mantle manufacturers. The principal materials and commodities required in the incandescent mantle industry were ramie and cotton yarn, thorium and cerium nitrates, asbestos yarn, magnesia rings, collodion, coal gas and cardboard boxes, all these being the finished products of other industries carried on in Great Britain. In addition to the manufacture of mantles, his company wholly or partly owned factories in Great Britain in which were manufactured ramie from china grass, thorium and cerium nitrates from monazite sand, and magnesia rings. The richest deposits of monazite sand were found in Travancore (South India), and the chief German manufacturers controlled these deposits by the proprietorship of the whole of the capital of the Travancore Minerals Co., Ltd., which had acquired the concession. A German company took the whole of the output of monazite sand from the concession, and refused to sell any to British mantle manufacturers. As a result, the Germans had, on the outbreak of war, large stocks of sand and of thorium and cerium, whilst British manufacturers had no stocks of sand, and no experience of the methods of manufacture of thorium therefrom.

Subsequent to the outbreak of war, the Board of Trade, in conjunction with the India Office, secured the transfer of the control of these deposits to the United Kingdom, and the production of thorium nitrate was developed here. He had personal knowledge of all the British thorium factories, which numbered four, and their capacity was more than equal to the country's total requirements, including a liberal estimate for the export trade. The only use for thorium nitrate was in the manufacture of incandescent mantles. At the present time, three out of four of the British thorium factories were closed completely, and the other was working about half time. Another factory, erected during the war, had never been put into operation, there being no market in consequence of the reduction of the requirements of British mantle factories. There were two English ramie factories, capable of meeting the whole requirements of the country, but they are now working half-time. Before the war the manufacture of magnesia rings for inverted mantles was conducted in this country by a branch of a German company. This factory was purchased by six of the principal British mantle manufacturers during the period of hostilities from the Public Trustee. A further factory was established during the war, and a subsequent extension by the acquisition of a pottery. The factories had made and supplied over 60 million rings in one year for mantle factories in this country, Belgium, France and the U.S.A. At present two of the factories were closed completely, and the other was working short time, with a skeleton staff.

British Equal to Foreign Quality

The results of tests he had carried out on mantles produced from factories all over the world had proved that British-made mantles were of good quality, and, on the whole, superior to those made in foreign factories. In fact, the German mantle policy was avowedly founded upon the supply of a cheap article of limited durability, which needed frequent renewal. In the manufacture of mantles and essential materials for such manufacture a very large percentage of the total cost was represented by direct and indirect wages. The cost of the prime raw materials was comparatively small. For instance, the cost of monazite sand was, at present, from £3 to £4 per ton unit, equivalent to 5d. to 7d. per gross of mantles. Raw ramie fibre cost from £65 to £70 per ton, so that the cost of this in a gross of mantles was 1s. 10d. to 2s. only. When the Germans had to replenish their stocks of these materials, the cost per gross of mantles would be very small.

Another commodity essential to the mantle industry was coal gas. In the manufacture of each mantle there was used from 1 to 1·6 cubic feet of gas at high pressure. If all the mantles required in this country were made here, it would mean a consumption of from 60 to 70 million cubic feet of gas. The pre-war price of gas in the district in which most of the mantle factories was situated was 1s. 6d. per 1,000 cubic feet, whilst the present price was equal to 4s. 7d. per 1,000 cubic feet. The last official figure for gas in Germany (March) was Mark 3.10 per cubic metre, equivalent to 1s. 8d. per 1,000 cubic feet, taking the mark at 1,200 to the £. Again, with regard to wages, those paid in Germany in April were equivalent to

1½d. per hour, as compared with the equivalent of 5d. per hour pre-war. In consequence of the increasing import of German mantles, his company had, during the past few months, entirely closed two mantle factories and one thorium factory. The total number of workers employed by the company at present was 415, as against 1,953 in 1920. The chief reasons why German manufacturers were able to sell mantles in this country at prices lower than the British price were the low English equivalent of the wages paid, and the extremely low English equivalent of items which went to make up overhead charges.

Various subterfuges are adopted, the witness said, to import mantles from Germany at prices below the price from time to time arranged by the German Mantle Convention. He produced a letter from the South Africa Company of Cologne (a German company), addressed to his company in February last, offering mantles for the English market at a price equivalent to about 36s. per gross net. The letter indicated a scheme whereby mantles could be sent here at an average net price of 20s. per gross, the suggestion being that such mantles should be exported from Germany as though intended for the North or South American markets, for which countries prices had not been arranged by the German Convention. Another subterfuge was to sell such mantles as imperfect. In a well-managed factory, "Seconds" should not exceed 5 per cent. of the total output. These imperfect mantles were ordinarily sold by British factories in plain boxes at about half the price of the sound mantles, but German manufacturers were selling so-called "Seconds" boxed in the same way as those invoiced as "Firsts."

Mr. Benjamin Bark

Mr. BENJAMIN BARK (manager of the factory of the Welsbach Co., at Wandsworth) referred to the improvements made in the plant used for manufacturing mantles, and said that present methods were far in advance of those which obtained when the gas mantle was first manufactured here. Some of the English factories were in advance of German factories. He had examined large numbers of German mantles, and was of the opinion that British mantles were at least equal, and in many cases superior, to the German-made article. About the year 1911 the Welsbach Company became associated with the chief German mantle manufacturing company, and as a result the witness had the opportunity of visiting the German factory, inspecting methods of manufacture and investigating their costs of production. It was found that the costs of production in the two countries were very similar, whilst the methods of manufacture in the British factory were often the better. In consequence of the imports of German mantles, the number manufactured by his company last year was little more than one-third of the quantity made in 1919, and the number of workers employed was about one-third of the normal, those remaining working short time. The capacity of the Welsbach Co.'s factory was such that, given a market for the goods, they could produce four times as many mantles as were being produced to-day and employ four times as many workers.

Mr. Louis Bruell

Mr. LOUIS BRUELL (manager of the Incandescent Mantle Department of Falk Stadelmann and Co., Ltd.) said that from 1906 to 1914 his company took the whole of the output of the factory of the British Incandescent Mantle Works, Ltd., a company owned by the principal German mantle manufacturers. This factory was laid out and equipped on the most approved and up-to-date Continental methods. During this period he had ample opportunities of comparing the qualities of mantles produced by that factory and his own company's factory, and could say without hesitation that the mantle produced in the latter factory to-day were of better quality than those produced in former years by the factory under German management. His company's factory was to-day employing only 50 per cent. of the number of workers it was capable of employing, and the output was only 50 per cent. of its capacity. He produced figures taken from the returns of the Statistical Office of H.M. Customs and Excise, showing imports of mantles from Germany. In 1920 imports were 21,359 gross; in 1921, 63,756 gross; and from January 1st to May 27th, 1922, 55,868 gross. These showed that the quantity imported in 1921 was nearly three times that in 1920, and the importations during the current year were at the rate of seven times the

1920 importations. Import prices, however, had decreased, the price in 1920 being 48/5d. per gross; in 1921, 35/1d. per gross; for the first four months of 1922, 31/2d. per gross; and in May, 1922, 26/10½d. per gross. During the period in which the export price to England was falling, the German internal price was increasing. He produced a number of confidential documents to prove this statement, and added that from inquiries he had made it appeared that German mantles were generally retailed to the consumer at ½d. or 1d. below the prices of British made mantles.

Mr. A. T. Metcalfe

Mr. A. T. METCALFE (secretary of Lighting Trades, Ltd.) said he received an offer from the proprietor of the Mammoth Gas Mantle Works, of Berlin, in February last, to supply incandescent mantles at 43s. 2½d. per gross f.o.b., the then ruling German export price to England. When the witness pointed out that first quality German mantles could be purchased at a lower figure, the proprietor offered to invoice part of the order as "second quality" mantles at 21s. 7d. per gross, and to execute an order for 1,000 gross of first quality mantles, half to be invoiced as seconds, which would bring the all-over price down to 32s. per gross. He clearly indicated that the mantles would all be of the same quality. The witness emphasised the point that the percentage of seconds in a well-managed factory was not more than 4 to 5 per cent. of the output.

Mr. J. T. Robin

Mr. J. T. ROBIN (managing director of Joseph T. Robin, Ltd., manufacturers of mantles) said that, on the invitation of the Government, in November, 1915, he examined mantles then being imported into this country as being of neutral origin, and demonstrated that the bulk of these mantles were of German make. He prepared a scheme, which was adopted, for the purpose of excluding mantles of enemy manufacture, and visited Dutch factories in order to ascertain their actual outputs. In the year preceding that in which the scheme was put into operation, some 30 millions of gas mantles were imported, the vast majority of which were of German manufacture. In the year subsequent to the scheme coming into operation, the imports from Holland fell to some 4 millions, of which only about 2,800,000 were cleared. The remainder were condemned. In two years mantle imports practically ceased. In view of the detailed examinations he had made of the various mantles imported, he was able to say that British mantles were at least equal to the German product. He was satisfied that, given the opportunity, the Germans would again attempt to set up the scheme for controlling the industry throughout the world which had fallen through at the outbreak of war, and if the British manufacture were reduced to a weak state, by reason of unfair competition due to depreciation of the mark, there would be nothing to prevent the scheme from being forced upon them. He was satisfied that if he were to-day paying the equivalent of the German rates of wages in his factory, he could manufacture and sell mantles at a price below that at which German mantles were imported. The difference between British and German costs was due to the depreciation of the mark, and particularly to the difference between the internal and external value. During 1919 he employed 500 workers, but that number had now dwindled to 50. Discussing prices of German mantles, the witness said that the same mantle might be sold at ten different prices in different districts; it depended entirely on the ironmonger who sold it, and the business was decided by the largest margin of profit.

Evidence was then given by representatives of the workers, which corroborated the statements already made as to the very large proportion of the workers who were unemployed.

This closed the case of the complainants.

Mr. KENNETH SWAN then introduced the case for the opposition, and asked for an adjournment in order that he might prepare his case more thoroughly. As to the interpretation of the Referee's decision under Part I, the Customs had determined temporarily to value the mantle at its total value, and he handed in a letter from the Board of Customs which he suggested bore out this statement.

Sir JOHN BARRAN said it appeared that the Board of Customs had not come to a decision, but, in order to safeguard itself, had assumed that the higher rate was the right one. It meant that they would take the money on deposit and hold it.

The inquiry was then adjourned until Monday, June 19.

Railway Rates Revision

Advisory Committee's New Classifications for Dangerous Goods

ON June 8 the Railway Rates Advisory Committee sat at the Royal Courts of Justice to consider objections which had been lodged by traders in regard to the proposed classification of Dangerous Goods by the railway companies. The Committee consisted of Sir Francis Gore-Brown (chairman), Sir Walter Berry, Mr. Jepson and Mr. Lockett.

At the outset Mr. Pike (for the railway companies) handed in a very large number of modifications which had been agreed between the traders and the railway companies, which, he said, had had the effect of minimising very much the number of cases which the committee would have to deal with. At the same time he called attention to the considerable reductions which had been made.

Mr. Malacrida (Association of British Chemical Manufacturers) raised the first objection, which was in regard to "Minimum Money Charges," and said the minimum charges proposed by the railway companies were in many cases actual charges in operation to-day. The traders had always pressed the principle of a minimum charge, but under the conditions set up the railway companies had matters in their own hands, and had said that they were empowered to charge such sums as they thought fit. The traders contended that the small parcels scale should meet all requirements. He submitted that the Rates Advisory Committee had no power under the Act to fix a minimum charge for a consignment of dangerous goods. The traders submitted that these dangerous goods should be subject to the same principle in regard to minimum charges as ordinary merchandise. Mr. Pike handed in a memorandum showing that the cost of dealing with these small consignments of dangerous goods was much greater than in the case of other goods, and he suggested it was only reasonable they should have a higher minimum than they got in the case of ordinary goods, where such precautions were not required. Under the Act they had power to refuse to carry the goods at all, or to make their own conditions of carriage.

The Committee decided that there should be varying minima, and when the question of quantum came to be considered by the Rates Tribunal, it would be open for the railway companies to state an amount which they thought reasonable, and it would also be open to the traders to state their objections.

Mr. FERN brought forward an objection in regard to "Stoneware Jars and Carboys at Owners' Risk," but the Committee, having considered the matter, did not see their way to make any alteration.

The question of "Increase of Class" where C and D rates are applied with S.S. conditions, was considered, and the Chairman said that when the Railway Rates Tribunal had to decide the quantum it would be open for the traders to come before them and state their case.

Benzole and Shale Oil

Mr. Malacrida said the next objection in regard to "Benzole" and eleven other traffics was to have been dealt with by Mr. Leonard, of Messrs. Capel, Carless and Leonard, but he was indisposed. He read a letter which Mr. Leonard had addressed to the Clearing House in which he stated that it was pointed out when these rates were first put in force that it was of vital importance that firms like their own should be put on a fair footing with millionaire oil concerns who had large depots for distribution of petroleum oil, etc., all over the country. Mr. Lukes said the railway companies proposed a difference of one class for three tons per truck, Class 16. The traders did not think that was a sufficient reduction, and their proposal of three classes was, he thought, most modest. They contended that this class of traffic should be placed as favourably as ordinary traffic. They thought there should be a reduction for heavy weights, and he referred to several cases where a substantial reduction was given for increased quantities. He pressed for Class 14 for three-ton trucks, and proceeded to refer to decisions given by the Committee in regard to gas water, creosote, tar, petroleum oils, naphthalene and anthracene. A small percentage of the traffic passed in drums and other containers, while over 90 per cent. was in owners' tank wagons. Mr. Pike thought the suggested reduction of one class was a considerable concession

from the existing Class 3, which corresponded with Class 18; this was for three-ton wagons. The decision of the Committee was that benzole in cans or drums of 10 gallons should be in Class 17, three tons per truck in Class 15, owners' tank wagons eight tons, Class 14, and 12 tons Class 13.

The question of "Shale Oil, Crude," was raised by a representative of the Scottish traders, who said he had objected to Class 7 for the non-dangerous goods, and he now appeared to object to Class 7 again. The only new evidence he had to put forward was the fall in values, and whereas in February last, when the other decision was given, the value was £5, it was now only worth about £3 7s. 6d. The Committee were unable to do anything in the matter of Shale Oil, Crude, where the railway company had made the concession of putting it into Class 7.

The next objection to be dealt with was in regard to "Paraffin and Petroleum," it being stated for the traders that there was an objection to the terms Paraffin "burning" oil, and that they asked for the retention of the term "Oils mineral, including paraffin and petroleum." They wanted Class 7, which they thought reasonable, especially as the traffic passed in large quantities. Mr. Petford handed up a statement to the Committee, and asked the Committee to place the traffic in owners' tank wagons in Class 7. After they had heard Mr. Pike the Committee decided that they could not make any alteration in the company's proposals.

An objection was raised on behalf of the manufacturers of "White Spirit," who suggested that the railway companies classified this under a misapprehension. The traders contended that "white spirit" was a misnomer. It flashed well over 73°, and they suggested that the old classification should be maintained. It was a distillation of petroleum burning oil. In reply to their objections as to the proposed classification, the railway companies had stated that they had included white spirit with articles of a kindred nature. Mr. Pike said that white spirit had been bracketed with turpentine substitutes in the classification for six or seven years. Mr. L. Archbutt, chief chemist to the Midland Railway, gave evidence regarding the composition of white spirit. The Chairman said the Committee had decided that three-ton lots should be in Class 14, and owners' tank wagons in eight-ton lots should be reduced from Class 14 to 13.

Naphtha and Xylol

With regard to "Naphtha Coal Tar," Mr. Pike said that in view of what had been previously decided, the railway companies were prepared to accept Class 16 for any quantity, Class 14 for three tons, and Class 13 for owners' tank wagons in 8-ton lots. This was agreed to by the traders.

The next objection was in regard to "Xylol, Class B." It was urged that this should come up and be classified the same as Naphtha Coal Tar. It usually passed in casks or drums. Mr. Pike thought that xylol was very much on the border line of 73°, but it made no difference to the selling price, whether above or below. Mr. Lukes said none of these liquids was sold on flashing point. The Committee decided that Xylol, Class B should be the same rate as in Class A.

The Committee sat again on June 9, when Mr. Clements, on behalf of the Boot and Floor Polish Association, stated their objection in regard to "Polishes, Stains and Dressings, A and B." Liquid polishes at present were charged Class 3 at ordinary risk, collected and delivered, and solid polishes at Class 2 ordinary risk, collected and delivered. It was proposed to put liquid polishes into Class 18, and to raise the solid polishes also to Class 18. The traders asked to be left where they were now in regard to solid polishes, while for liquid polishes they thought they should have Class 15. Mr. Pike said that this traffic was in Class 2 as ordinary blacking and ordinary boot polish without anything inflammable in it, then when the railway companies found that this inflammable stuff was passing they put it into the dangerous portion of the classification, but they did not at that time make any difference in the classification. The Committee decided that there was no justification for putting these solid polishes above Class 16.

An objection was raised in regard to "Fusel Oil," the traders asking for a reduction in view of it being practically

a raw material. Mr. Pike said they were asking for no increase, and having regard to the value of the article, it seemed correctly put in Class 18. He admitted it was not very dangerous. The Committee decided that in casks or drums it should be in Class 17.

Mr. Lukes supported the objection in regard to "Pyridine base," and said the present classification was Class 1, S to S. The railway companies proposed Class 16, and the traders asked for Class 8 for 8-ton tanks, Class 7 for 12-ton tanks, and Class 6 for 14-ton tanks. In regard to the entry they had agreed with the Clearing House to take out the owner's tank wagons entirely, and they had discussed there the question of Pyridine Crude. The traffic passed in railway tanks from one works to another for rectification. Mr. Pike said they were prepared to put it in Class 10. Mr. Lukes thought 10 was too high for this raw material, and that it should not be higher than crude Benzol. The Committee decided it should go in Class 8.

The proposal of the railway companies to put "Phenol" into Class 13 was objected to by the traders, but the Committee thought it should remain in that class.

Bleaching Solutions

Mr. Fern appeared in support of the objections which had been lodged regarding "Hypochlorite Bleaching Solution, Hypochlorite of Soda and Bleach Liquor." They asked for a lower classification than proposed by the railway companies on the carboys in 2 and 4-ton lots. At present they were classified Class 1 S to S, and it was proposed to put them in Class 16. Actually in practice the railway companies did not charge Class 1 on 2-ton lots, but gave them exceptional rates which were practically on Class "C" basis. The Committee decided that Class 8 was fair. Two-ton loads would remain in Class 16, 3½-tons in Class 10, and owners' tank wagons Class 8.

The next objection was in regard to "Bisulphite of Soda." The traders asked for a reduction from Class 10 for 4-ton lots and further reductions for owners' tank wagons. They were content with Class 10 for 2-ton lots, and wanted Class 7 for 4 tons in casks, Class 7 for 6-ton lots in tank wagons, and a lower class for larger tanks. Mr. Pike said this traffic was not only of a bleaching nature, but frequently contained a proportion of sulphurous acid, and was properly classified in 10. So far as the tanks were concerned, they were prepared to make it 8 instead of 10. The decision of the Committee was Class 10 for 2-ton lots and Class 8 for 8-ton lots in owners' tank wagons.

Mr. Fern referred to "Caustic Potash Liquor and Caustic Soda Liquor." A wagon would always carry 4 tons, and at present it was carried at alkali rates. The railway companies proposed to put it in iron drums in Class 10, and give them Class 8 for 4-ton lots. The traders wanted to maintain their present position. Dr. Morley gave evidence on behalf of the traders, and eventually it was decided that the companies' offer to put both in Class 10 for drums, and Class 8 for owners' tank wagons, 8 tons per truck, was reasonable.

Mr. Fitton raised the question of "Chrome Tanning Liquid," and said this was simply an application to reduce the rates for quantities. The railways' proposals only provided for carriage in casks, any quantities, Class 13. The traders asked for 2-ton lots or 4-ton lots. It would load 3½ tons to 4 tons per truck. The Committee would not make any alteration to the classification proposed by the railway companies.

Mr. Malacrida said the traders accepted the proposal of Class 13 for "Acetate of Lead" for any quantity, but asked for a reduction to Class 10 for 2-ton lots, and Class 9 for 4-ton lots. He understood this traffic could be loaded about 4 tons in a truck, and the orders varied from 4 to 20 tons. The Committee decided that they could not make any alteration for 2 or 4-ton lots.

Mr. Malacrida said the objection in regard to "Arsenate of Soda" had been withdrawn.

An objection in regard to "Zinc Dust" was raised by Mr. Fitton, who said this was an application for a reduction for quantities. It was in Class 10, and they asked for Class 8 for 4-ton lots. Mr. Lukes pointed out that this was an imported traffic, and likely to be imported by users in 50 and 100-ton lots. The Committee could not make any alteration.

Mr. Malacrida, dealing with the objection in regard to "Charcoal," said the only point here was an application for reduced classification for quantities. The traders asked for

Class 8 for 4-ton lots and Class 9 for 3-ton lots. The Committee decided that the 2-ton class was the correct class for this traffic.

Mr. Lukes supported the objection in regard to "Spent Oxide of Iron," and said at present it was in Class A, S to S, company's risk. The value was 20s. to 30s. a ton, and the commodity was simply refuse from the gasworks. London was the largest producing centre. The traffic competed with imported iron pyrites from Spain. The conveyance of spent oxide of iron was not altogether a business proposition. Mr. Pike said 24 per cent. of the fires amongst miscellaneous dangerous goods reported to the companies was due to spent oxide of iron. The Committee decided that Class 2 was the proper class.

An application was made by Mr. Clements on behalf of the traders that the distinction between safety and non-safety matches for the purposes of carriage should be done away with. The Committee decided that the distinction should be maintained.

With regard to the "Holmes Patent Signal Light," containing sulphite of calcium, the Committee saw no reason to make any alteration in the proposed classification.

Calcium Carbide

The objection in regard to "Calcium Carbide" was put forward by a gentleman who said he was a Past President of the British Acetylene and Welding Association. Calcium carbide had been in Class 3 C and D, and the railway companies now proposed Class 18, but the traders asked for a lower classification. Mr. Pike said that under the Merchant Shipping Act, 1894, this traffic was under restriction for sea carriage, and that showed its nature. The companies had records of two explosions and one fire directly attributable to carbide of calcium. The Committee decided it should be in Class 16.

A representative of the agricultural engineering industry upheld the objection which had been lodged in regard to "Compressed Oxygen." The traffic was carried in quantities from 3 to 4 tons, packed in cast iron cylinders, under high pressure. They asked for a lower classification than Class 2. They wanted Class 9 for 4-ton lots, Class 11 for 2-ton lots, and Class 13 for smaller quantities. The decision of the Committee was that it should be in Class 15.

Mr. Hoyle, for the traders, supported the objection in regard to "Liquefied and Compressed Chlorine," for which the railway companies proposed Class 18 for cylinders and Class 17 for tanks. The traders' proposals were Class 14 for tanks, Class 16 for cylinders in 2-ton lots. They did not raise any objection to Class 18 for small lots, but they objected to the same classification for small and large lots. He proceeded to read an extract from the report of the Alkali Inspector, showing that no trouble had arisen through liquefied compressed chlorine. If it was any inducement to the railway companies they would make the minimum 4 tons. Mr. Pike said the railway companies were somewhat reluctant to extend the traffic in tanks, and would certainly desire a good deal more experience before accepting it permanently in that way. It was a poisonous gas, and if the tank was to leak the results would be serious. The Committee decided that it should be in Class 18, but that owners' tank wagons 12-ton trucks should go into Class 16.

The objection of the traders in regard to the proposed classification of "Liquefied Sulphur Dioxide" was for a reduction to Class 14, but if the Committee considered that too much to ask, the traders as an alternative would ask for Class 16 for any quantity, Class 14 for 4-ton lots. The Chairman said the Committee did not think there was sufficient case for alteration from the existing classification.

Mr. Malacrida said the objection in regard to "Lamp Black" had been withdrawn.

The Egyptian Dye Industry

ACCORDING to a report from H. M. Commercial Agent at Cairo, thousands of small dye-houses are scattered throughout the country. In nearly every village, he states, there are one or more dye-houses that dye in blue or black chiefly, as they mostly use Indian natural indigo or synthetic indigo from Germany, the United Kingdom, and Switzerland. With the exception of very few dyeing establishments in Cairo and Alexandria, who are adopting up-to-date methods, all the remainder adhere to the very old and primitive methods of dyeing.

Safeguarding of Industries Act (1921).*To the Editor of THE CHEMICAL AGE.*

SIR,—On behalf of the Chemical and Dyestuff Traders' Association, which has repeatedly drawn attention to the hardships inflicted on traders by the Safeguarding of Industries Act, might I be allowed to comment briefly on the situation which has arisen consequent on the decision of the Cabinet to put Part II. in operation in respect to fabric gloves.

The proposed import duty will not even protect the comparatively small fabric glove industry, but will only protect it in so far as its limited home trade demand is concerned. In the larger export markets its position will remain unchanged and unimproved. The important Lancashire yarn industry is to be prejudiced for the sake of this comparatively small advantage to a comparatively small industry.

At first sight it may appear that the decision in respect to fabric gloves is of minor interest to the chemical trade, but the important point to be emphasised is that this is the thin end of the wedge. The Government evidently believe that the storm of protest which greeted the application of this ill-advised and ill-conceived measure is dying down, and that the time has come when they can proceed with and enlarge their scheme of interference with trade.

The Government, having had such a sorry experience under Part I. of the Act, may be expected at once to develop the second part of the Act and to make every attempt to bring one chemical after another within its scope.

The trade should be under no illusions. The term Safeguarding of Industries Act is a misnomer. This Act is not an Act to safeguard industries, but is pure and unadulterated Tariff Reform. It is a test case; and if the country endures it, far-reaching measures of Tariff Reform will undoubtedly follow in its wake, and that at no long distant date.

It behoves all who have the remotest interest in the trade of the country, and particularly in the export trade—by means of which, directly or indirectly, we all live—at once to raise the strongest protest against the application of Part II. of the Act, which will undoubtedly add to the damage which has already been done by the methods of administration of the first part of the measure.

One might conclude by asking what useful purpose this Act has accomplished since it came into operation? What new British industries have been established within the shadow of its protection? It is common knowledge that scarcely any move has been made by chemical manufacturers as a result of the Act; but, on the other hand, the cost of living has been advanced by, in some cases, a definite increase in prices, and in other cases an equally definite retardation of the fall in prices which would otherwise have occurred, and in industry one trade after another has been hampered and penalised by excessive prices which this legislation causes it to pay for its essential raw material.

The position of this country can only be rehabilitated by the development of its export trade, and measures such as this, which hinder and retard the development of export business, must be scrapped.—Yours, etc.,

J. J. BARLOW, Secretary.

Chemical and Dyestuff Traders' Association, 22, Buckingham Gate, S.W.1.

Society of Public Analysts

At the ordinary meeting, held on Wednesday, June 7, at the Chemical Society's Rooms, Burlington House, London, Mr. P. A. Ellis Richards, President, in the chair, certificates were read for the first time in favour of Messrs. G. S. Robertson, D.Sc.(Dun.), F.I.C., F. J. Martin, M.A.(Cantab.), A.I.C., and F. S. Shadbolt, A.I.C. Certificates were read for the second time in favour of Messrs. A. S. Whamond and T. J. Ward. Mr. Frederick Major, B.Sc.(Lond.), A.I.C., was elected a member of the Society.

Abstracts of Papers

A paper on "The Action of Natural Waters on Lead" was presented by John C. Thresh, M.D., D.Sc., F.I.C. Following the examination of the action of distilled water on lead (*Analyst*, 1921, 46, 270) the author now gave an account of the action of various salts commonly found dissolved in water, comparing the results with those obtained with moor-

land waters. He found that the action produced was not accounted for by the presence of the small quantities of chlorides, sulphates, etc., but was due to an organic acid, probably present in peat, and to a silicate, and by the addition of one or both of these he was able to imitate any natural moorland water.

The observations recorded in a paper on "The Composition of Cows' Milk in the Sudan," by A. F. Joseph, D.Sc., F.I.C., and F. J. Martin, M.A., A.I.C., embodied the results of the analyses of samples of cows' milk examined in the Wellcome Tropical Research Laboratories, Khartoum, during the last 10 or 15 years. The authors found that the Sudan resembles other tropical countries in that the cows' milk is rich both in fat and other solids. The total fat production is approximately the same morning and evening, while there is a distinct seasonal variation in composition.

The process described in a paper on "The Estimation of Meconic Acid in Opium," by H. E. Annett, D.Sc., F.I.C., and M. N. Bose, M.A., was shortly as follows. They precipitated the meconic acid as its calcium salt by adding an excess of calcium chloride solution to an aqueous extract of the opium. They then washed the calcium salt, decomposed with dilute hydrochloric acid, and after crystallising the meconic acid, washed, dried, and weighed it. Corrections were applied for meconic acid not precipitated by calcium chloride, and for meconic acid dissolved by the hydrochloric acid under conditions used in the experiment.

In a paper on "The Use of the Daylight Lamp in Volumetric and Colorimetric Analysis" W. Singleton described the advantages of the light from the daylight lamp over ordinary artificial light in increasing the efficiency of many chemical indicators. The results obtained in many titrations, using indicators in natural daylight, artificial daylight, and ordinary artificial light, were given, it being found that the range of colour covered by the end-point with many indicators was shorter and more accurately observed in artificial daylight as in natural daylight. In addition to increasing the accuracy of these titrations, the use of the daylight lamp greatly increased the ease by which this accuracy could be attained. The daylight lamps used—which are inexpensive—were of the tungsten filament type, using daylight glass bulbs.

Safeguarding of Industries**Sir Philip Magnus on Free Trade Opposition**

SIR PHILIP MAGNUS, in a letter to the *Yorkshire Post* on Monday, drew attention to the organised effort which is being made to induce the Government to repeal the Safeguarding of Industries Act. The old Free Trade party, he says, seem to have learnt nothing from the changed conditions consequent on the war, nor from the serious difficulties we experienced, attended with no small danger, during the war.

The Safeguarding of Industries Act, states Sir Philip, is intended to provide some remedy for these abnormal trade conditions. The Act refers more particularly to the so-called key industries—i.e., to the production of those commodities which are largely employed in, and are indeed essential to, the manufacture of a variety of goods. They are mainly chemical, and are consequently not easily defined, and their value and importance can only be fully understood and explained by the scientific expert. It is for this reason that whilst the Act imposes duties on the importation of a great variety of different substances, and the administration is attended with some inconvenience to many manufacturers, the Act itself in no way is inconsistent with the general principles of Free Trade as understood in pre-war days. The Act exists mainly to shield, for a time, in the building up of an industry, those manufacturers engaged in the production of commodities, previously imported, which it is essential to the security and well-being of our country should be well made. In conclusion, he recalls having stated a few years ago, as a recognised supporter of Free Trade, that Free Trade was too often regarded as an article of faith, whereas it was only a policy founded on expediency and nothing more, following the line of the resultant of economic forces acting in different directions. During the past few years these forces had varied in magnitude and direction, and our Free Trade policy must vary accordingly.

Busy Europe: Politics and Business

By Sir Ernest Benn

THE very natural prominence which has been given to political questions, and the frequency with which international conferences are held and international crises developed and settled, are natural outcomes of the war and the Treaty of Peace, but these things are giving to us and the world in general a dangerously false impression of fundamental conditions in Europe, and are doing much to retard that resumption of normal trade and commerce upon which all so much rely. A close study of the full report of the Genoa Conference leaves one with the impression that Europe is a pitiful mass of dejected peoples all vying with one another to explain how unbearable are their burdens, and how bad is their plight. There is, of course, a certain amount of truth in all this, but it is of the greatest importance that most of these questions should be got into better perspective.

False Commercial Impressions

Many of the questions which loom so large in the newspapers and occupy so much time in public discussion, and sound so important when discussed in broad principle, are of no more interest or moment to the persons inhabiting the countries concerned than is the question of Proportional Representation to the average English citizen. Yet because these political matters are so much before the public, they are allowed to cloud our vision, and give an impression in commercial circles—in England certainly—that Europe is not in a fit position to trade, and that the markets of Europe are for the time being not worth consideration. There are, of course, many people who know better, but our trading figures disclose all too clearly how widely these impressions are held.

To take a few examples, the city of Vienna brings to the mind of the average Englishman famine, rickety children, absence of food, poverty, and general wretchedness and starvation. That is the effect upon the mentality of the public of all the efforts which have been made to alleviate the distress which did undoubtedly exist in certain parts of Vienna a couple of years ago. The real facts are not disputed: an absurd policy of food control copied from England, coupled with the workings of currency depreciation, drove food off the markets of the towns, at the same time causing gluts in country districts. These matters are now practically right, but they leave their effect upon the public mind. Vienna to-day is by no means happy, but no more is London or Manchester. And Vienna is full of ordinary, active business mortals, getting along with the ordinary work of life in a more or less ordinary way, and desirous, and indeed anxious, to develop commercial relations with the rest of the world.

The same sort of misunderstanding arising from the undue prominence of political problems is seen in connexion with Germany. Germany is supposed to be poor and bankrupt and unable to pay the demands of the Allies. That may be true so far as the German Exchequer is concerned, but to the ordinary traveller Germany has an appearance of prosperity and wealth which surpasses anything in Europe. The streets and the parks of Berlin are full of happy, active and opulent people, while a trip through Westphalia at night discloses industrial activities in the form of furnaces and factory chimneys which remind one of the Black Country and Sheffield in their palmiest days rolled into one.

Or speak of Hungary, and the English mind turns at once to Bela Kun, to Whites and Reds, to revolutions and counter-revolutions, to massacres and pogroms, and other political incidents, traces of which it is very difficult for the ordinary commercial visitor to find when he travels in this delightful land. There is no doubt at all that things are not what they were in Hungary, or what they will be again; but there is equally no doubt that business is waiting to be done in Hungary, and that conditions are quite good enough for the business man who will take the trouble to study them.

Russia is supposed to be closed to normal business, and for practical purposes that is undoubtedly so, but nevertheless it is significant to notice that the Russian rouble is quoted on the Berlin money market. On May 22 seven and a half million roubles could be purchased in Berlin for a sovereign. It is surely not to be presumed that people buy seven and a half

million roubles for the fun of looking at them, and it is hard to imagine any use to which these roubles can be put except for the purchase of Russian goods.

There are other ways in which our knowledge of the Continent of Europe is by no means as complete and accurate as it should be. In political discussions a very great deal is made of the inconveniences which arise from passport arrangements, and all the restrictions placed upon the movements of the various nationalities over frontiers. Distressing pictures are painted of customs barriers and import and export restrictions, all of which things, of course, abound. Within the last few months I have crossed and recrossed all the frontiers of Central Europe, been examined and re-examined by officials in every sort of uniform; my passports are blotched all over with stamps and signatures; I have answered questions as to my sex, my height, my age, my religion, and my politics in many languages, and yet I can state without the least hesitation that there is no frontier in the world that I know, except New York, which has half the terrors, half the inconveniences, or half the indignities that are put upon one in endeavouring to enter an English port.

Continental Travelling Facilities

It is none too widely known that travelling facilities on the Continent are the best in the world, and they are certainly in some European countries the cheapest in the world. We have nothing in England to equal the second-class sleeper on the German main line, while there is nothing anywhere to approach the multiplicity of facilities for travel by air now freely available in Central Europe.

A great deal too much has been made of the difficulties of currency. To the uninitiated it seems at first sight a trifle complicated to have to pay five or six thousand crowns for a cab fare, or 150 marks for a lunch, but none of these things are more troublesome than the currency which has for some generations past served the purposes of our oldest allies, the Portuguese. The currency difficulties are quoted far too commonly as an excuse for the absence of business. Manufacturers and merchants on both sides are far too prone to take refuge in this question as an excuse for their own lack of enterprise and initiative. A fluctuating currency is a great inconvenience. It would be absurd to belittle the seriousness of the position of some of the European countries in this matter, but a fluctuating currency is, nevertheless, not a bar to business, if the business man is willing to take a little extra trouble. Many firms are adopting the very simple expedient of doing business both ways; one well-known manufacturer is selling his goods freely in a country with a very uncertain currency, he having taken the precaution to provide himself with two or three buying agencies, thus enabling him to buy and sell and balance his books, and be completely independent of any fluctuation in the rate of exchange. This case is perhaps exceptional and shows commendable enterprise. It is not necessary to point out to experienced commercial people that any sort of currency can always be bought at the moment that it is required, and that business transactions can be in this way relieved altogether of any element of risk on account of changes in currency values.

There is urgent need for a reconsideration of our position in regard to Europe. The politics of Europe are important, and it is, no doubt, important that we should understand them and take our proper place in the political councils of this sorely tried continent. But it is equally important that we should not allow impressions gained in the political field to warp our views on commercial matters, or to mislead us into a totally erroneous impression of commercial possibilities.

British Cyanides Co. v. the King

IN the High Courts on Tuesday and Wednesday Sir Francis Newbolt heard a reference from Mr. Justice Darling in a petition of right by the British Cyanides Co., Ltd., against the Crown, in respect of failure to give sufficient notice of the termination of a contract for the supply of potassium permanganate. An agreement was arrived at under which the Crown would submit to judgment for £25,000 with costs, £10,000 to be paid within ten days and the balance within a month. Judgment was entered accordingly.

Chemical Matters in Parliament

Research Apparatus and Chemicals

Major M. Wood (House of Commons, June 12) asked the President of the Board of Trade whether his attention had been drawn to the statement by Sir J. J. Thomson in his recent presidential address to the Institute of Physics, to the effect that the Safeguarding of Industries Act had increased the difficulties of research in this country; that he had lost more time since the war by the use of imperfect materials than in the previous forty years he had been working; that over and over again apparatus which had taken a fortnight or three weeks to construct had cracked during the next night, with the result that the whole thing had to be repeated; and whether he would consider Sir J. J. Thomson's suggestion that a system of licences under the Act for research institutions should be set up.

Mr. Baldwin said he had not seen the precise statement quoted by Major Wood, but he was aware of Sir J. J. Thomson's general attitude on this matter, and that he did refer to difficulties alleged to be caused by the Safeguarding of Industries Act. He would point out, however, that the inferiority of apparatus and materials could not be ascribed to that Act, since there was no prohibition of importation and the duty was not of sufficient magnitude to deter an investigator from obtaining foreign goods if their quality was appreciably higher than that of the domestic products; there was, as a matter of fact, conclusive evidence that Germany was far from maintaining her pre-war standard of quality. The answer to the last part of the question was in the negative.

In reply to further questions by Lt.-Col. Raw, who alleged that research was hindered by the necessity of students preparing compounds which could formerly be purchased; and Dr. Murray, who referred to a statement that certain organic chemicals obtained from British firms in this country, had been found impure and useless for research, Mr. Baldwin said he was aware of the allegations. He would suggest that it would be a useful course for research workers and others concerned to place themselves in direct communication with the British makers of fine chemicals, who would, he felt sure, welcome any detailed criticism and co-operation in the development of the British industry to their mutual advantage.

Grants for Chemical Research

Dr. Murray (House of Commons, June 12) asked the Chancellor of the Exchequer whether he was aware that the chemistry department of the University College, Dundee, had stated that the Safeguarding of Industries Act has put an additional tax on the department, particularly in the provision of materials for research; that research work is undoubtedly hampered by the Act; that they have had to abandon certain work which they would have undertaken had the cost of materials been less; and whether he would consider raising the public grants to such institutions by the amount of the tax imposed on them by the Act.

Sir Robert Horne said he doubted if the increased cost of research could properly be ascribed, except to a very limited extent, to the operation of the Safeguarding of Industries Act, in view of the great increase in cost of all kinds in recent years. He hoped that the stimulus given by the Act to scientific work in this country would more than offset any disadvantages. The distribution of Exchequer grants to universities and colleges was made after a very careful consideration of their individual needs, and he could not undertake to direct a specific increase as suggested in the question.

British Dyestuffs Corporation

Mr. Kiley (House of Commons, June 12), asked the President of the Board of Trade whether he was aware that negotiations were in progress for a working arrangement regarding production, distribution, and prices between the British Dyestuffs Corporation, Ltd., and the principal dyemakers in Germany; and whether the Government had expressed their approval or disapproval of such a working agreement.

Mr. Baldwin said he was aware that certain discussions had taken place between the interests mentioned. The views of His Majesty's Government must obviously depend upon the terms of the agreement, if and when one was reached; but he understood that the discussions had so far been only of a preliminary and non-committal character.

Mr. Vernon Clay's Position

Mr. Kiley (House of Commons, June 12) asked the President of the Board of Trade whether Mr. Vernon Clay had resigned his directorship or managership of the British Dyestuffs Corporation; if so, whether he could state the reason for Mr. Clay's action; whether several of the principal technical experts had recently left the service of the corporation; and whether, in view of the further fact that Dr. Levinstein had also resigned his directorship on the ground that, from absence of practical technical direction, the corporation was failing to achieve its object, he would appoint a Select Committee to inquire into the whole subject.

Mr. Baldwin said that changes in the directorate or staff of the British Dyestuffs Corporation were not required to be reported to the Board of Trade, but he understood that Mr. Vernon Clay had not resigned his directorship. As regards the last part of the question, he would refer the inquirer to the answer given to Mr. Ormsby-Gore on May 29. (See THE CHEMICAL AGE, Vol. VI, p. 739.)

He was not aware that Mr. Clay had resigned any appointment held by him in connection with the British Dyestuffs Corporation.

Dyestuffs Corporation Directorate

Replying to Major Barnes (House of Commons, June 12), Mr. Baldwin said he had received no report from the Government directors of the British Dyestuffs Corporation, Ltd., as to the recent changes in the directors of the Corporation.

Safeguarding Act Revenue

In reply to Mr. Kenyon (House of Commons, June 12), Sir Robert Horne supplied the following statement showing the amount of duty collected under the Safeguarding of Industries Act during the month of May, 1922, and during the period from October 1, 1921, to May 31, 1922, specifying the amounts collected on goods consigned from France, Belgium, Italy, Germany, U.S.A. and Japan.

Country whence consigned.	October 1, May, 1922. 1921, to May 31, 1922.	
	£	£
France	4,545	28,830
Belgium	103	3,072
Italy	503	4,881
Germany	11,539	90,681
U.S.A.	5,529	38,177
Japan	—	716
Other Countries	3,848	23,478
Total	26,067	189,835

Gas Mantles

Mr. Baldwin informed Captain Wedgwood Benn (House of Commons, June 12) that duty is only being levied on certain ingredients of gas mantles, in accordance with the decision of the Referee.

The Institute of Metals

THE annual autumn meeting of the Institute of Metals will take place in Swansea on Wednesday, Thursday and Friday, September 20, 21 and 22 next. Members will assemble in Swansea on Tuesday, September 19, during the afternoon of which day the Honorary Local Secretary's office will be open for the distribution of papers and invitation cards. On September 20, at 10 a.m., there will be an official welcome by the Mayor, and the remainder of the morning will be devoted to the reading and discussion of papers. After an official luncheon a visit will be made to the University College at Singleton, where tea will be provided. In the evening there will be a reception by the Mayor. On September 21 the morning will be devoted to the reading and discussion of papers, and after luncheon there will be visits to works, the evening being devoted to entertainment. It may be necessary for a morning session to be held on the concluding day of the meeting, but arrangements will be made for motor excursions in the district.

From Week to Week

SIR ALBERT SPICER will be the chairman of Spicers, Ltd., for the first year, and will be succeeded by Mr. H. G. Spicer, who in the meantime will be deputy-chairman.

It is reported that Professor Duparc, of Geneva, has, at the invitation of the Soviet Government, undertaken the organisation of the PLATINUM INDUSTRY of Russia.

Addressing the annual meeting of the Zinc Corporation, Ltd., on Wednesday, Mr. F. A. Govett said the company had an option to acquire about a sixth interest in the Australian rights of THE ELMORE PROCESS.

An Open Fellowship of £200 per annum for the prosecution of POST GRADUATE RESEARCH in gas chemistry is available at Leeds University. Applications should reach the Registrar, The University, Leeds, by June 19.

The withdrawal of the Australian embargo on ex-enemy importation on August 1 will, it is officially notified, not affect the prohibition of the entry of FOREIGN DYES into Australia, which, it is reported, there is no intention of revoking.

On June 10 MRS. OERTLING, widow of the late Mr. L. Oertling, entertained the Queen Alexandra League at a garden fête, held at her residence, The Hermitage, Barnes. The programme included a pastoral play written by Miss Christine Oertling.

Speaking at the annual meeting of the Canadian Section of the Society of Chemical Industry, Dr. R. F. RUTTAN laid stress on the increasing importance of chemical research in connexion with the development of natural resources and industrial expansion.

THE GRAESSER-MONSANTO CHEMICAL WORKS, LTD., announce the removal of their London offices to 39, Billiter Buildings, Billiter Street, London. The new telephone number is Avenue 549, and the telegraphic address is "Graesanto, Fen, London."

Canada and the Canadian Institute of Chemistry will be represented at the THIRD ANNUAL MEETING of the International Union of Pure and Applied Chemistry by Dr. R. F. Ruttan, the retiring president of the Society of Chemical Industry, and Dr. A. T. Charron.

SIR RICHARD GLAZEBROOK has been appointed a representative of Cambridge University at a conference to be held at Basle in August to discuss means for the establishment of closer bonds of union between the Universities of Switzerland and those of the United Kingdom.

Laying the foundation stone of the new UNIVERSITY COLLEGE, NOTTINGHAM, on Wednesday, Lord Haldane announced the receipt of a further donation of £10,000 from Sir Jesse Boot, who has already given the site and £110,000. An anonymous gift of £100,000 was also announced.

MR. H. M. RIDGE, M.E., M.Inst.M.M., F.G.S., of the Ridge Roasting Furnace and Engineering Co., 2, Great Winchester Street, London, is leaving in a fortnight's time for South Africa and expects during his trip to visit the Transvaal and Rhodesia. His address will be Mount Nelson Hotel, Capetown.

A public meeting of the NATIONAL UNION OF SCIENTIFIC WORKERS was held in the Botanical Theatre, University College, Gower Street, London, on Thursday, Mr. H. G. Wells in the chair. An address was given by Mr. F. W. Sanderson, Headmaster of Oundle, on "The Duty and Service of Science in the New Era."

APPLICATIONS ARE INVITED for the Drapers' Company's research scholarship in dyeing and for a research scholarship in colour chemistry, tenable in the Huddersfield Technical College during the session 1922-23. Full particulars and forms of application may be obtained from the Secretary, Technical College, Huddersfield.

At a recent meeting of the directors of the RIO TINTO COMPANY, Lord Milner was elected chairman. Time is thus given to Sir Charles Fielding, who remains on the board, for closer control over the technical and production side of the company's business, work in connexion with which has greatly increased of late. Sir Arthur Steel-Maitland continues as managing director.

MR. D. MILNE WATSON, the Governor of the Gas Light and Coke Co., on Wednesday unveiled the monument which has just been erected at Beckton in memory of the company's employees at those works who fell during the Great War. In unveiling the tablet, the Governor stated that no fewer than 5,000 men belonging to the company had answered their country's call, of whom 500 had fallen.

A general meeting of the members of the ROYAL INSTITUTION was held on Monday, Sir James Crichton-Browne, treasurer and vice-president, in the chair. Mr. H. Cooke, Mr. E. Davies, Miss Joan Evans and Mrs. A. Jacobs-Larkcom were elected members. The chairman reported the death of M. Ernest Solvay, an honorary member of the Institution, and a resolution of condolence with the relatives was passed.

The Albert Medal of the Royal Society of Arts for 1922 has been awarded by the council to SIR DUGALD CLERK, in recognition of his important contributions, both theoretical and practical, to the development of the internal combustion engine. The Albert Medal was founded in 1863 as a memorial of the Prince Consort, who was president of the Society from 1843 to 1861, and is awarded annually "for distinguished merit in promoting arts, manufactures, and commerce."

The first of a series of week-end Conferences of Employers and Employed, organised by the INDUSTRIAL LEAGUE AND COUNCIL, was held on June 10 and 11, at Sir Ernest Benn's residence at Oxted, Surrey. Among those present were Mr. John Ames and Major A. G. Church. Mr. H. G. Williams read a paper on "The Fundamental Causes of Unemployment," and after considerable discussion a resolution was passed recommending that each Joint Industrial Council should appoint a special committee of inquiry to investigate the question of unemployment.

MR. W. F. VAUGHAN SCOTT, who has been Commercial Secretary to H.M. Legation in Santiago, Chile, is at present in the United Kingdom, and will be in attendance at the Department of Overseas Trade, 35, Old Queen Street, London, until June 24. He is prepared to interview firms interested in trade with Chile, and will also, if desired, furnish general information concerning trade with Bolivia. It is proposed that after June 24 Mr. Vaughan Scott shall visit some of the important industrial centres in the provinces. Applications for interviews with Mr. Vaughan Scott should be addressed to the Department and the reference 3808/TG/GP quoted.

The formal opening of the Anglo-Persian Oil Company's NEW REFINERY at Llandarcy, near Swansea, is to take place on June 29. The opening ceremony will be performed by Mr. Stanley Baldwin, M.P., President of the Board of Trade. The refinery, which is described as the last word in scientific construction, covers an area of some 650 acres. It has taken three years to construct, and has cost about £3,000,000. The present throughput of the refinery is upwards of fifteen million gallons per month, and this will shortly be considerably increased. The daily production of petrol is about 450 tons. The company also possesses a refinery in the Persian Gulf with a capacity of more than double that of the Llandarcy, and is also erecting refineries in Scotland, France and Australia.

Among the papers expected to be read at a meeting of the ROYAL SOCIETY on June 22, are: "The Motion of a Sphere in a Rotating Liquid," by G. I. Taylor, F.R.S.; "On Errors arising in the Measurement of Unsymmetrical Spectrum Lines," by Professor T. R. Merton, F.R.S., and D. N. Harrison; "A Study of Catalytic Actions at Solid Surfaces. Part VIII. The Action of Sodium Carbonate in Promoting the Hydrogenation of Phenol. Part IX. The Action of Copper in Promoting the Activity of Nickel Catalyst," by E. F. Armstrong, D.Sc., F.R.S., and T. P. Hilditch, D.Sc.; "On the Structure and Chemical Activity of Copper Films and the Colour Changes accompanying their Oxidation," by C. W. Hinshelwood, communicated by Professor J. W. Nicholson, F.R.S.; and "Heat of Crystallisation of Quartz," by R. C. Ray, communicated by Dr. M. W. Travers, F.R.S.

Presiding on Monday at the annual meeting of the LAGUNAS NITRATE COMPANY, LTD., Mr. R. E. Morris said the season now ending had not been a satisfactory one, chiefly owing to the inclement weather, and the pool would probably be left with about 200,000 tons, whereas at one time it was hoped it would be able to liquidate the whole of its stocks. The prospects for a continuation of deliveries were favourable, and it might be that, at the end of this month, the total stock on this side would not exceed 250,000 tons, which was not large compared with that of previous years. It was unfortunately the stocks of nitrate in Chile which would prevent for a considerable time any general resumption of activity on the Pampa. These would probably amount to 1,500,000 tons on June 30, and they must be materially reduced, as the companies could not afford to have so much money locked up.

References to Current Literature

British

- COAL.**—The inorganic constituents of coal, with especial reference to Lancashire seams. Part II. The iron in coal. F. S. Sinnatt and N. Simpkin. *J.S.C.I.*, May 31, 1922, pp. 164-167 T.
- BISMUTH COMPOUNDS.**—The anodic corrosion of bismuth, with some notes on bismuth compounds. E. B. R. Prideaux and H. W. Hewis. *J.S.C.I.*, May 31, 1922, pp. 167-171 T.
- PHOTO-CHEMISTRY.**—Phototropy of inorganic salts. Cuprous chloride and bromide. G. Singh. *Chem. Soc. Trans.*, May, 1922, pp. 782-785.
- 2-*p*-Dimethylaminostyrylpyridine methiodide, a new photographic sensitiser. W. H. Mills and W. J. Pope. *Chem. Soc. Trans.*, May, 1922, pp. 946-947.
- ORES.**—Ore deposits and their genesis in relation to geographical distribution. J. W. Gregory. *Chem. Soc. Trans.*, May, 1922, pp. 750-772.
- NITRO-TOLUIDINES.**—Note on 2:3- and 2:5- dinitro-*p*-toluidines. J. Scott and R. Robinson. *Chem. Soc. Trans.*, May, 1922, pp. 844-846.
- SURFACE TENSION.**—The surface tension of mixtures of alcohol and water at 25°. L. L. Bircumshaw. *Chem. Soc. Trans.*, May, 1922, pp. 887-891.
- The determination of surface tension from the maximum pressure in bubbles. S. Sugden. *Chem. Soc. Trans.*, May, 1922, pp. 858-866.
- ANALYSIS.**—Estimation of the nitro group in aromatic organic compounds. Part II. T. Callan and J. A. R. Henderson. *J.S.C.I.*, May 31, 1922, pp. 157-161 T.
- The use of potassium bromate in volumetric organic analysis. T. Callan and J. A. R. Henderson. *J.S.C.I.*, May 31, 1922, pp. 161-164 T.
- A "micro-Kjeldahl" method of determining nitrogen. A. R. Ling and W. J. Price. *J.S.C.I.*, May 31, 1922, pp. 149-151 T.
- EXPLOSIVES.**—A method of testing the degree of incorporation of explosives and other powders. E. P. Perman. *J.S.C.I.*, May 31, 1922, pp. 155-157 T.
- SULPHIDES.**—Note on the composition of "golden antimony sulphide." D. F. Twiss. *J.S.C.I.*, May 31, 1922, pp. 171-172 T.
- RESIDUAL AFFINITY.**—Researches on residual affinity and co-ordination. Part VIII. Interaction of tellurium tetrachloride and β -ketones. G. T. Morgan and H. D. K. Drew. *Chem. Soc. Trans.*, May, 1922, pp. 922-940.
- SYSTEMS.**—Heterogeneous equilibria: the ternary system sodium sulphate-sodium carbonate-water. A. E. Dawkins. *Chem. Soc. Trans.*, May, 1922, pp. 776-781.
- Mixed crystal formation in ternary systems containing water, ammonium chloride, and ferrous, cobaltous or nickel chloride. F. W. J. Clendinning. *Chem. Soc. Trans.*, May, 1922, pp. 801-805.
- The systems ethyl alcohol-water-paraffins from +30° C. to -30° C. W. R. Ormandy and E. C. Craven. *J. Inst. Petroleum Tech.*, April, 1922, pp. 181-193.
- OILS.**—An investigation into the physico-chemical significance of flashpoint temperatures. W. R. Ormandy and E. C. Craven. *J. Inst. Petroleum Tech.*, April, 1922, pp. 145-172.
- The significance of the interpretation of the chemical analyses of seepages. J. E. Hackford. *J. Inst. Petroleum Tech.*, April, 1922, pp. 193-206.

United States

- DYESTUFFS.**—Notes on the manufacture of the safranines. Part II. R. Sansone. *Color Td. J.*, May, 1922, pp. 198-201.
- Properties and application of madder. Part II. J. F. Springer. *Color Td. J.*, May, 1922, pp. 204-205.
- THERMO-CHEMISTRY.**—The heat of solution of zinc in hydrochloric acid. T. W. Richards and T. Thorvaldson. *J. Amer. Chem. Soc.*, May, 1922, pp. 1051-1060.
- The heat of solution of cadmium in hydrochloric acid. T. W. Richards and S. Tamaru. *J. Amer. Chem. Soc.*, May, 1922, pp. 1061-1066.

- RUBBER.**—Modern developments in rubber machinery. Part II. J. W. Howie. *Rubber Age*, June, 1922, pp. 165-174.

The use of accelerators in the United States. L. E. Weber. *Rubber Age*, June, 1922, pp. 179-180.

- SYSTEMS.**—Equilibria in the systems iron: carbon: oxygen and iron: hydrogen: oxygen, and the free energies of the oxides of iron. E. D. Eastman. *J. Amer. Chem. Soc.*, May, 1922, pp. 975-998.

- ANALYSIS.**—Trivalent titanium. Part II. The estimation of copper and iron in the presence of each other. W. M. Thornton, junr. *J. Amer. Chem. Soc.*, May, 1922, pp. 998-1001.

- CERAMICS.**—Economic handling of materials in porcelain manufacture. A. P. Ball. *J. Amer. Cer. Soc.*, May, 1922, pp. 235-247.

Standard methods of ultimate chemical analysis of refractory materials. *J. Amer. Cer. Soc.*, April (Part II.), 1922, pp. 50-56.

French

- RADIO ACTIVITY.**—The age of minerals according to the theory of radioactivity. E. Gleditsch. *Bull. Soc. Chim.*, May, 1922, pp. 353-372.

- CARBAMATES.**—Study of the transformation of ammonium carbamate. C. Matignon and M. Fréjacques. *Bull. Soc. Chim.*, May, 1922, pp. 394-412.

- AMINO-ALCOHOLS.**—Study of amino-alcohols: homologues of novocaine. E. Fourneau and J. Payal. *Bull. Soc. Chim.*, May, 1922, pp. 424-435.

- AUTOXIDATION.**—The auto-oxidation of organic sulphur compounds. M. Delépine. *Compt. rend.*, May 15, 1922, pp. 1291-1293.

- KETONES.**—The two α,β -substituted propiophenones and their products of interaction with sodamide. M. Ramart and G. Albesco. *Compt. rend.*, May 15, 1922, pp. 1289-1291.

- ACIDS.**—The fatty acids of colza oil. E. Raymond. *Bull. Soc. Chim.*, May, 1922, pp. 414-419.

- NITRO-COMPOUNDS.**—The replacement of diazo groups by nitro groups. V. Vesely and K. Dvorak. *Bull. Soc. Chim.*, May, 1922, pp. 421-424.

- ORGANO-METALLIC COMPOUNDS.**—The systematic extension of the preparation of organo-metallic compounds; application of iron ethyl iodide. A. Job and R. Reich. *Compt. rend.*, May 22, 1922, pp. 1358-1361.

3,6 - Tetramethyl - diamino - cyanoseleno - pyronine. M. Battégay and G. Hugel. *Bull. Soc. Chim.*, May, 1922, pp. 440-444.

- REDUCTION.**—The reduction of oxides with hydrogen. E. Berger. *Compt. rend.*, May 22, 1922, pp. 1341-1343.

- TELLURIUM.**—The "dynamic" allotropy of tellurium. A. Damiens. *Compt. rend.*, May 22, 1922, pp. 1344-1346.

- SULPHIDES.**—The flocculation of colloidal arsenic sulphide; influence of concentration of colloid, agitation and temperature. A. Boutaric and M. Vuillaume. *Compt. rend.*, May 22, 1922, pp. 1351-1353.

Phosphorescent zinc sulphide. A. A. Guntz. *Compt. rend.*, May 22, 1922, pp. 1356-1358.

German

- ACIDS.**—The configuration of simple α -oxyacids. K. Freudenberg and F. Brauns. *Ber.*, May 13, 1922, pp. 1339-1352.
- Croconic acid and leuconic acid. B. Homolka. *Ber.*, May 13, 1922, pp. 1310-1311.

A synthesis of N-alkylidene-amino-acids and their conversion into N-alkyl-amino-acids by hydrogenation. Part I. H. Scheibler and P. Baumgarten. *Ber.*, May 13, 1922, pp. 1358-1379.

The conversion of active glyceric aldehyde into active glyceric acid. A. Wohl and R. Schellenberg. *Ber.*, May 13, 1922, pp. 1404-1408.

- CATALYSIS.**—The action of platinum in the catalysis of oxygen-hydrogen mixtures and the use of titanium sulphate for controlling the course of the reaction. K. A. Hofmann. *Ber.*, May 13, 1922, pp. 1265-1274.

Patent Literature

Abstract of Complete Specifications

- 179,586. PLASTIC MATERIALS, MANUFACTURE OF. W. Petersen, 6, Lloyd's Avenue, London, E.C.3, and E. V. Clark, 56, St. Anne's Crescent, Lewes. Application date, January 11, 1921.

The process is for the manufacture of phenol-formaldehyde condensation products. It is known that hard and infusible resins which are good electric insulators may be obtained by preparing a liquid condensation product from a phenol and formaldehyde or trioxymethylene. This product is then mixed with a large proportion of liquid or solid organic acid and a small proportion of mineral acid, allowed to solidify, and hardened by heating. This process has the disadvantage that a mould is necessary throughout the process, owing to the low viscosity of the material. In the present process, an organic carboxylic acid alone is used, and the condensation passes through a stage when it is highly viscous and non-adhesive, so that it may be removed from the mould and baked. An initial condensation product is first prepared by heating phenol and polyoxymethylene, with or without a basic catalyst, until a viscous liquid is obtained. This product is mixed with about half its weight of commercial lactic acid (50-60 per cent.), and heated to boiling preferably in a closed and partly exhausted vessel. The heating is continued until the product is a viscous syrup, which is non-adhesive and may be used as a binder for any filling material such as asbestos, wood flour, or china clay. The mixture is finally hardened by baking. In an alternative method, the condensation of the initial product may be stopped when the product is fluid, so that the filling material may be more readily incorporated. The lactic acid may be replaced by formic or acetic acids.

- 179,610. HYDROCARBONS, PROCESS FOR REFINING. J. Demant, 103bis, Avenue de Villiers, Paris. Application date, February 4, 1921.

When hydrocarbons are treated with sulphuric acid of 66° Bé., the impurities are converted into polymerisation products of higher boiling point, and finally into products which are insoluble in the hydrocarbon but soluble in the acid. Tars are also formed which retain some of the hydrocarbon and thus cause a loss, which, in the case of the refining of benzole, may be 8-12 per cent. Further, only about 40-50 per cent. of the acid is recoverable in strength about 40° Bé. In the present process, the acid is used as a contact substance only, the hydrocarbon is not subject to sulphonation, and valuable by-products are obtained. The acid used is of a strength less than 60° Bé., preferably 46°-48° Bé., and the mixture is heated. The polymers remain in solution in the oil and the acid may then be withdrawn for use again. The hydrocarbon is then neutralised and distilled, and a residue consisting of oils and varnish is obtained. When solvent naphtha is treated by this process, the residue consists of a viscous oil having a freezing point of -10° to -15°C. Xylene, benzene, and toluene may be purified in a similar manner. The sulphuric acid may be replaced by phosphoric acid. Several detailed examples of the process are given.

- 179,622. RAW RUBBER, TREATMENT OF. Sir S. C. Davidson, Sirocco Engineering Works, Belfast. Application date, February 5th, 1921.

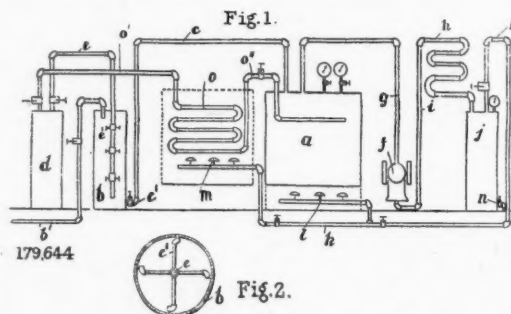
In the treatment of raw rubber, the freshly coagulated rubber is subjected to massaging or kneading between rollers to form a solid roll, but this process does not remove all the contained water. In the present process, the rolled mass of rubber, while still under full pressure, is enveloped in a tight wrapping of absorbent material such as cotton webbing, which absorbs the residue of moisture and allows it to evaporate, while the subsequent drying of the cotton causes a further contraction and compression of the rubber. The wrapping is formed in such a manner that it may be placed in position before the rubber is removed from the rollers. It is found that rubber so treated may be subjected to a pressure of five tons per sq. in. without expelling any further moisture.

- 179,643. COMPLETE GASIFICATION OF CARBONACEOUS FUEL, APPARATUS FOR. J. F. Simpson, Gasworks, Scunthorpe, Lincs. Application date, February 8, 1921.

The apparatus avoids the heat losses due to external firing of a retort, and to the sensible heat of the producer gas formed in supplying heat to the setting. A retort is mounted vertically above a generator, and a supply hopper above the retort, with no intervening valves. The generator is connected at the bottom to the bottom of an adjacent regenerator filled with chequer brickwork, and at the top to the top of a similar regenerator on the opposite side. One regenerator is provided with a steam inlet and a secondary air inlet, and the other with a secondary air inlet only, while both are provided with blast pipes and outlet valves. In operation, the generator is ignited and the apparatus filled with coke to the top of the retort. The hopper is filled with coal and closed, and an air blast is forced downwards through one regenerator, upwards through the generator, and downwards through the other regenerator to the air. The blast is prevented from passing through the retort owing to the outlet pipe at the upper end being water-sealed. Towards the end of the "blow" period, secondary air is admitted to the regenerator through which the waste gases are passing, to burn the carbon monoxide, and when the temperature is sufficiently high in this regenerator the direction of the blast through the apparatus is reversed. When the fuel in the generator is at a high temperature, the blast is cut off and steam is passed through one of the regenerators into the bottom of the generator. The resulting water gas passes upwards through the retort, distilling off the volatile products which pass off to a purifying plant. Liquid fuel may be admitted at the top of the retort.

- 179,644-5. DISTILLING AND CRACKING HYDROCARBON OILS, PROCESS AND APPARATUS FOR. S. L. Gartlan, 362, Dupont Street, Toronto, and A. E. Gooderham, 4, Lampart Avenue, Toronto, Canada. Application date, February 8, 1921.

A retort *a* is connected by a pipe *c* to a mixing tank *b*, and the latter by a pipe *e* to a steam generator *d*. The outlets *e*¹ for the steam are arranged tangentially so as to impart a rotary movement to the oil in the tank. An emulsified mix-



ture of steam and oil is thus produced, and the temperature is raised to about 40°C. The mixture is then discharged into the retort *a*. The retort is also connected by a pipe *g* to a compressor *f*, and the latter to a refrigerator *h* and receiving tank *j*. The light vapour and gas arising from the oil at 40°C. are drawn off and condensed in the refrigerator *h*, and the non-condensable gas passes on to the pipe *k* and burners *l*. The retort is heated to 60°C. and the vapour again withdrawn and compressed. The non-condensable gas is also supplied to the burners *m* of a superheater *o*, through which steam is passed to the retort *a*. A pressure gauge is provided on the retort, and when this indicates a partial vacuum due to the withdrawal of vapour, the temperature is raised so as to distil the next fraction of the oil. The vaporisation effected in the retort amounts only to a fractional distillation of the oil, but the subsequent compression effects the conversion of the vapour into lower-boiling products. The pressure exerted by the compressor is such as to maintain a pressure of about 125 lb.

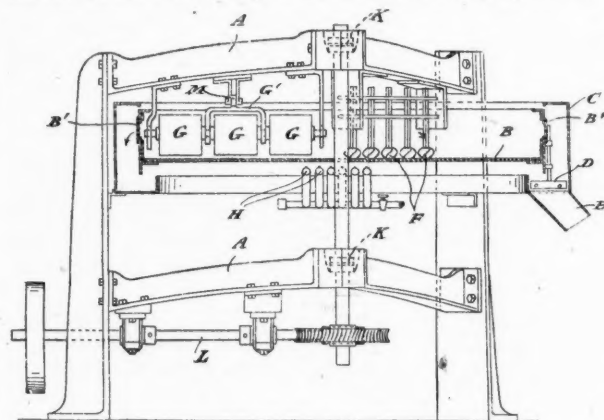
per sq. in. for the low-boiling fractions (up to 300°C.), and an additional pressure of 25 lb. per sq. in. for every 100° increase in temperature. The resulting distillate is of substantially constant density and boiling points throughout the working range. When the process is applied to Mexican crude petroleum, naphtha vapour is given off at 60° C., and gasoline at about 90° C. Kerosene is given off up to 300°C. and is converted into lower boiling products by the compressor. It is found that about 75 per cent. of the original oil may be recovered in the form of a high-grade naphtha averaging about 72° Bé.

179,716. GAS GENERATORS FOR GENERATING LOW GRADE GAS. J. Pierson and O. G. Pierson, 30, Boulevard Haussmann, Paris. Application date, February 24, 1921.

A vertical gas generator is arranged so that its outlet at the bottom is a short distance above the grate bars, and a free cone of fuel is thus formed between the outlet and the grate. An annular boiler surrounds the generator, and steam is delivered to a perforated annular channel surrounding the outlet of the generator and also to the enclosed space below the grate bars. A mixture of steam and air is thus supplied adjacent to the free conical surface of the fuel, and is drawn into the generator, and air is also drawn in with the steam and supplied below the grate bars.

179,723. DRYING SULPHATE OF AMMONIA AND OTHER CHEMICAL SALTS, APPARATUS FOR. J. B. Hansford, The Gas Works, Bedford. Application date, March 1, 1921.

The apparatus is of the kind in which the material is dried on a horizontal rotating tray, heated from below. A circular tray B is mounted on a vertical shaft rotating in bearings KK and driven by a shaft L. The tray is heated by a series of gas burners H arranged radially below it. The wet crystals are spread over the surface of the tray by centrifugal force, and are turned over during the rotation of the tray by means



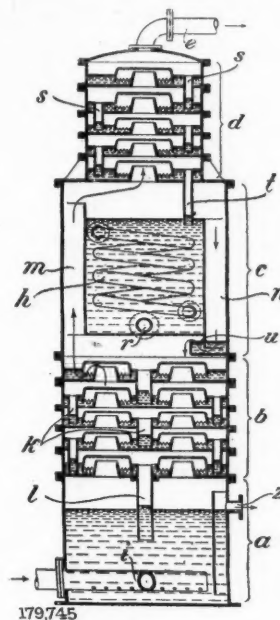
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of two series of ploughs F. A series of rollers G are arranged so as to crush the crystals to any desired fineness. The rollers may be weighted by means of a lever M. The rim of the tray is provided with openings B¹ covered by wire gauze, through which the dried salt passes into the annular receiver C. The salt may be directed by means of scrapers D into one or more outlets E, from which it may pass to other trays below, if the drying is not completed in one tray.

179,745. DISTILLATION COLUMNS. Firm C. Still and H. Petsch, Recklinghausen, Westphalia, Germany. Application date, March 15, 1921.

The object is to avoid the use of a separate preheating apparatus in a column still for distilling the more volatile constituents from a mixture containing also high boiling constituents. The invention is particularly applicable to comparatively small stills. A distillation column *b* is arranged above a collecting vessel *a*, and is surmounted by a heater *c* and rectifier *d*. The liquid mixture is supplied continuously through a perforated pipe *r* and flows upwards over a steam

coil *h* to a vertical overflow conduit *n* which is liquid-sealed at *u*. The liquid flows on to the uppermost tray of the column *b* and then downwards through passages *k* to the lower trays.



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The liquid finally flows through pipe *l* to the vessel *a*, where it is distilled by steam supplied through a perforated pipe *i*, or a closed steam coil. The distilled vapour passes upwards through the trays in counter-current to the liquid. The vapour then passes upwards through a separate vertical conduit and, together with vapour liberated by the heater, passes into the rectifier *d*. The rising vapour passes in counter-current to the descending condensate of higher boiling point. A sharp separation of low and high-boiling constituents is obtained. An essential feature of the apparatus is that the conduits *m*, *n* are in the form of pipes not communicating with the annular space.

179,753. AMINO-PHENOLS OR AROMATIC AMINO-ACIDS, PRODUCTION OF. W. Lewcock, W. G. Adam, N. E. Siderfin, of Gas Light and Coke Co., Beckton, London, E.16, and W. L. Galbraith, of Gas Light and Coke Co., Horseferry Road, Westminster, London, S.W.1. Application date, March 19, 1921.

To obtain amino-phenols or aromatic amino-acids a phenolic or acid azo compound, nitrophenol, or nitro aromatic acid is reduced by hydrogen sulphide in the presence of an alkali carbonate. The hydrogen sulphide may be in the form of waste gas from ammonia scrubbers, containing about 15 per cent. of hydrogen sulphide and 85 per cent. of carbon dioxide. In an example, a solution of 50 parts of benzene azosalicic acid in 44 parts of sodium carbonate dissolved in about 440 parts of water, is heated to boiling and treated in a retort with gas containing hydrogen sulphide. Aniline is distilled, and the solution is then cooled in contact with the gas and then acidified. Sulphur is precipitated and filtered off, and the amino-salicic acid is precipitated by a further addition of acid. A yield of 85-90 per cent. is obtained. Examples are also given of the application of the process to the reduction of *p*-chlorobenzene-azosalicic acid, 5-nitro-salicic acid, benzene azo-phenol, alizarin yellow R, phenol azophenol, brilliant orange R, orange II, and chrysamine G.

NOTE.—Abstracts of the following specifications, which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention: 156,799 (Norsk Hydro-Elektrisk Kvaelfstofaktieselskab), relating to manufacture of concentrated nitrous gases, see Vol. IV., p. 404; 156,800 (Norsk Hydro-Elektrisk Kvaelfstofaktieselskab), relating to converting nitrous gases into

concentrated nitric acid, see Vol. IV., p. 404; 157,860 (C. Clerc and A. Nihoul), relating to zinc white, see Vol. IV., p. 456; 158,906 (Badische Anilin und Soda Fabrik), relating to manufacture of alcohol, see Vol. IV., p. 541; 160,759 (Armour Fertiliser Works), relating to production of aluminium chloride, see Vol. IV., p. 626; 163,330 (Aluminium Industrie Akt.-Ges.), relating to manufacture of calcium nitrate, see Vol. V, p. 77; 164,310 (Soc. du Gaz de Paris), relating to manufacture of illuminating gas, see Vol. V., p. 166; 164,719 (Deutsche Gold- und Silber Scheide-Anstalt vorm. Rössler), relating to manufacture of sodium cyanide, see Vol. V., p. 192.

International Specifications not yet Accepted

178,104. CHLORINATION OF CELLULOSE LYES. A. Schmidt, 20, Rue Auguste Vacquerie, Paris. (Assignee of C. Schmidt, 20, Rue Auguste Vacquerie, Paris). International Convention date, April 7, 1921.

Sugar is separated from sulphite cellulose lyes, which are then concentrated and chlorinated. Chlorine is passed through and the solution filtered and treated with a chlorate and hydrochloric acid. The soluble acid products are suitable for tanning materials or resin substitutes.

178,400. ALUM. ETABLISSEMENTS MÉTALLURGIQUES DE LA GIRONDE. Quai de la Souys, Bordeaux, France. International Convention date, April 11, 1921.

Waste aluminium is dissolved in sulphuric acid which is saturated with alum. To convert the sulphate into an alum, ammonium, potassium, or sodium sulphate is added. Alternatively the aluminium is dissolved in an alkali saturated with alum, and the necessary sulphuric acid subsequently added.

LATEST NOTIFICATIONS.

- 180,978. Vulcanisation of rubber employing amines and open-chain aldehydes and similar substances and products obtained thereby. Nangatuck Chemical Co. May 28, 1921.
- 180,988. Process for the recovery of the ethylene contained in industrial gases for the manufacture of alcohol or ether. Damiens, A. A. L. J., Loisy, M. C. J. E. de, and Piesse, O. J. G. June 2, 1921.
- 180,990. Electro-chemical control systems. Soc. des Etablissements Gaumont. May 28, 1921.
- 181,009. Manufacture of new carbonyl derivatives of α -naphthol. Society of Chemical Industry in Basle. May 31, 1921.
- 181,014. Manufacture of condensation products from urea, thiourea or their derivatives and aldehydes. Pollak, F. May 31, 1921.
- 181,019. Process and apparatus for extracting sulphur from gases containing sulphuretted hydrogen. Damiens, A. A. L. J., Loisy, M. C. J. E. de, and Piesse, O. J. G. June 3, 1921.
- 181,023. Filter presses. Traun's Forschungslaboratorium Ges., H. O. July 5, 1918.
- 181,027. Process for producing artificial masses by means of solidifying colloidal material. Butonia Gomb es Vegyitermekes Gyara Reszvenytarsasag. June 3, 1921.

Specifications Accepted, with Date of Application

- 159,217. Centrifugal separators. G. C. Barnes and J. R. Morgan. February 19, 1920.
- 159,817. Producing ammonium chloride in coking or distilling coal in coking plants and gasworks. O. L. Christenson and B. A. Hedman. March 3, 1920.
- 160,161. Cracking hydrocarbons. Kansas City Gasoline Co. March 12, 1920.
- 161,161. Producing ammonium chloride in burning or distilling alum, slate, or similar bituminous shales. O. L. Christenson and B. A. Hedman. March 27, 1920. Addition to 159,817.
- 167,736. Gas, Process and apparatus for making. General Oil Gas Corporation. August 9, 1920.
- 169,498. Producing ammonium chloride from coal shales, Method of. O. L. Christenson and B. A. Hedman. October 6, 1920. Addition to 159,817.
- 174,052. Barium hydrate, Continuous process for the manufacture of. C. Deguide. January 13, 1921.
- 174,581. Alkali metal silicates, Process for the manufacture of. C. Deguide. January 22, 1921.
- 180,384. Extraction of metals from their compounds, Methods of. P. Freedman and E. Greetham. January 26, 1921.
- 180,394. Drying materials, Process of and apparatus for. E. M. Bassler. February 11, 1921.
- 180,395. Working of shaft furnaces, especially blast furnaces, Process for. E. Diepschlag. February 11, 1921.

- 180,396. Feeding of fine materials to shaft furnaces, gas producers, and the like. E. Diepschlag. February 11, 1921.
- 180,397. Conveying the mouth dust and other fine ores in black furnace operations. E. Diepschlag. February 11, 1921.
- 180,433. Mordant dyeing dyestuffs and chromium compounds thereof, Manufacture of. O. Y. Imray. (Society of Chemical Industry in Basle). February 22, 1921.
- 180,447. Resolving emulsions, Process for. H. A. Gill. (Sharples Speciality Co.). March 3, 1921.
- 180,546. Sulphuric acid, Manufacture of. E. A. Gaillard. May 10, 1921.
- 180,611. Vegetable charcoal. Wilson Bros. Bobbin Co., Ltd., and S. C. Bone. October 22, 1921.

Applications for Patents

- Akt.-Ges. für Anilin-Fabrikation. Manufacture of thin films. 15847. June 7. (Germany; June 20, 1921.)
- Aktieselskabet Norske Saltverker. Process of producing anhydrous magnesium chloride. 16086. June 9. (Norway, June 13, 1921.)
- Baker, Sons, & Perkins, Ltd., J. Grinding and crushing to a state of fine subdivision. 15673. June 6.
- Chemische Fabrik J. A. Wülfing and Sefton, K. Process for production of water-soluble permanent preparations containing acetylsalicylic acid. 15856. June 7.
- Dufraisse, C., and Moureau, C. Process for treating substances liable to oxidation by action of air. 15842. June 7. (France, June 8, 1921.)
- Lewis, J. Process for reconditioning grain, copra, etc. for oil extraction. 15925. June 8.
- Maxted, E. B. Manufacture of nickel catalyst for hydrogenation of oils, etc. 15872. June 7.
- May & Baker, Ltd., and Pomaret, N. Manufacture of 3:3'-diamino 4:4'-dihydroxyarsenobenzene, etc. bases. 16170. June 10.
- Prentice, A. T. Burning of sulphur. 16096. June 9.
- Schindelmeyer, J. Production of camphor, borneol, and isoborneol. 15741. June 6.
- Soc. l'Air Liquide (Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude). Cooling apparatus for receptacles for liquefied gases. 15725. June 6. (France, June 8, 1921.)
- United Alkali Co., Ltd. Manufacture of cleansing compositions. 15947. June 8.
- Wilisch, J. A. Device for separation of solid, liquid, and semi-gaseous matter from gases and vapours. 15828. June 7.
- Young, G. Extraction of oil by solvents, combined with use of such solvents for refrigerating. 15736. June 6.

Patents Court Cases

APPLICATION has been made under Section 20 of the Patents and Designs Acts, 1907 and 1919, for the restoration of lapsed patent No. 129,033 (The British Aeroplane Varnish Co., Ltd., and J. G. Ward), relating to solutions of cellulose esters. The application is in the names of Titanine, Ltd., I. M. Ward, and G. L. Ward. Any notice of opposition must be given by August 8, 1922.

Lord Moulton and Coal-Tar Dyes Specialisation of German Chemists

A CORRESPONDENT of the *Glasgow Herald* recalls a story of the late Lord Moulton, who, speaking at a meeting in Manchester on the reason for the decline of the coal-tar industry, which he attributed to the "English dislike of study," he gave an amusing experience of German specialisation. The story is given in his own words:

"Once I found myself on the top of one of the Dolomite Mountains, and the only other person there besides the guides was a German. I found out that he was a chemist, and I began to talk upon a chemical subject. He told me he was only an organic chemist. He had not exhausted my resources, and I began to talk of coal-tar and pharmaceutical products. Then he told me that he was a coal-tar by-product chemist. That did not beat me, because I had just been fighting a case of canary yellow. I thought I would get some subject which was common to us, and I slipped into the subject of canary yellow. Still the same ominous silence for a time, and then he said: 'I am only a coal-tar chemist dealing with blues.' But I had not finished. With an Englishman's pertinacity, not believing I was beaten, I racked my brains for a coal-tar blue, and I gradually, without a too obvious change of subject, slipped into that. Then he finally defeated me, because he said in equally solemn tones, but equally proud of the fact, 'I only deal with methyl blues.'"

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to THE CHEMICAL AGE, and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.

LONDON, JUNE 15, 1922.

BUSINESS has been steadily recovering from the effects of the holidays, and in some markets a satisfactory turnover is reported.

In the textile districts, however, demand remains very quiet, although it is gradually awakening. Prices continue on the up grade as far as important chemicals are concerned, and the trade outlook is distinctly healthy. Export trade has been fair.

General Chemicals

ACETONE has advanced in price, and a further improvement is looked for.

ACID ACETIC.—A larger turnover is reported, and the price is firm.

ACID CITRIC has again advanced considerably in price, and premiums are paid for prompt or early delivery.

ACID FORMIC is a slow market, and the price is upheld.

ACID LACTIC is uninteresting.

ACID OXALIC is in slow demand at recent prices.

TARTARIC ACID is decidedly dearer and in active demand.

BARIIUM CHLORIDE is practically a nominal market, the price is very high, and there is no sign of any weakening of the position.

CREAM OF TARTAR is in better demand, and is a strong market. FORMALDEHYDE is firm, and spot supplies are very difficult to obtain; a temporary shortage has developed.

LEAD ACETATE is a firm market, and the small supplies available are barely sufficient to cover the demand.

LEAD NITRATE is unchanged.

LITHOPONE remains a firm market, and prices incline upwards.

POTASSIUM CARBONATE is unchanged.

POTASSIUM CAUSTIC is a nominal market, with almost complete absence of demand.

POTASSIUM PRUSSIAN fully maintains its advance in price, and available supplies are almost negligible.

SODIUM ACETATE continues in active demand. Makers are well booked for the next few months.

SODIUM BICHRONATE has been in better demand, and an improvement in value is not unlikely.

SODIUM NITRATE.—More business is reported, and stocks are firmly held at recent levels.

SODIUM PHOSPHATE is in fair demand; price unchanged.

SODIUM PRUSSIAN is scarcer than ever; nominal supplies only are available for the remainder of this year. The price has advanced.

WHITE LEAD is unchanged.

ZINC OXIDE is without special feature, remaining scarce and firm.

BLEACHING POWDER.—English makers have fixed their price for the second half of this year at £12 per ton, carriage paid to consumers' works.

Coal Tar Intermediates

Business during the past week has continued quiet, but more interest has been about on export account.

ALPHA NAPHTHOL continues without change in price.

ALPHA NAPHTHYLAMINE is firm at last quoted figures.

ANILINE OIL and SALT are without change.

BENZIDINE BASE.—Rather more interest has been shown, both in base and sulphate.

BETA NAPHTHOL is steady at last quoted limits.

DINITROCHLOROBENZENE is firm and has been in demand, both for home and export.

DINITRONAPHTHALENE.—A few inquiries have been received.

DIPHENYLAMINE is very firm with stocks short.

"G" SALT.—Some orders have been booked on home account.

"H" ACID has been in demand, both for home and export, and no large stocks are available.

MONOCHLOROBENZENE has been interesting on export account.

NAPHTHIONIC ACID is firm, with a fair home trade passing.

NITROBENZOL.—The usual orders have been booked.

PARA AMIDOPHENOL is in demand on home account.

PARANITRANILINE is quiet, with a certain amount of inquiry.

PARAPHENYLENE DIAMINE.—Orders have been booked on home and export account.

"R" SALT is featureless.

SULPHANILIC ACID is in demand for consumption in this country.

Coal Tar Products

The market is in general steady, and in the case of some articles there is somewhat of a scarcity of prompt parcels.

90's BENZOL is slow of sale, and the value is 1s. 11d. to 2s. per gallon on rails.

PURE BENZOL is without change at 2s. 4d. per gallon.

CREOSOTE is still very firm, and prompt is worth 4½d. per gallon in the Midlands and 5½d. to 5½d. per gallon in London.

CRESYLIC ACID is rather more pressed for sale, and prices are barely maintained. The Pale quality, 97/99%, is still quoted at 2s. 3d. to 2s. 4d., and the Dark, 95/97% at 1s. 10½d. to 2s. per gallon.

SOLVENT NAPHTHA.—The demand is slow, and there is no change in price.

HEAVY NAPHTHA.—Transactions are limited, and the price remains about 1s. 9d. per gallon.

NAPHTHALENE is very quiet, and the demand poor.

PITCH.—Some fresh demand has arisen for parcels for prompt shipment, but transactions are extremely limited. Business has been done at 67s. 6d. to 70s. f.o.b. East Coast, and 71s. f.o.b. London. There is some inquiry for next season's deliveries, but makers are not yet disposed to meet buyers' views.

Sulphate of Ammonia

There is no change in the position.

Current Prices

Chemicals

		Per	£	s.	d.		£	s.	d.	
Acetic anhydride	lb.	0	1	8	to	0	1	10
Acetone oil	ton	77	10	0	to	80	0	0
Acetone, pure	ton	72	0	0	to	73	0	0
Acid, Acetic, glacial, 99-100%	ton	66	0	0	to	67	0	0
Acetic, 80% pure	ton	43	0	0	to	44	0	0
Arsenic, liquid, 2000 s.g.	ton	67	0	0	to	70	0	0
Boric, cryst.	ton	60	0	0	to	65	0	0
Carbolic, cryst. 39-40%	lb.	0	0	6	to	0	0	6½
Citric	lb.	0	2	6	to	0	2	7
Formic, 80%	ton	65	0	0	to	66	0	0
Gallic, pure	lb.	0	2	11	to	0	3	0
Hydrofluoric	lb.	0	0	7½	to	0	0	8½
Lactic, 50 vol.	ton	40	0	0	to	43	0	0
Lactic, 60 vol.	ton	43	0	0	to	45	0	0
Nitric, 80 Tw.	ton	30	0	0	to	31	0	0
Oxalic	lb.	0	0	8½	to	0	0	8½
Phosphoric, 1.5	ton	38	0	0	to	40	0	0
Pyrogallic, cryst.	lb.	0	6	0	to	0	6	3
Salicylic, Technical	lb.	0	0	10½	to	0	1	0
Salicylic, B.P.	lb.	0	1	3	to	0	1	5
Sulphuric, 92-93%	ton	7	10	0	to	8	0	0
Tannic, commercial	lb.	0	2	3	to	0	2	9
Tartaric	lb.	0	1	4½	to	0	1	4½
Alum, lump	ton	13	0	0	to	14	0	0
Alum, chrome	ton	28	0	0	to	29	0	0
Alumino ferric	ton	9	0	0	to	9	5	0
Aluminium, sulphate, 14-15%	ton	10	10	0	to	11	0	0
Aluminium, sulphate, 17-18%	ton	11	10	0	to	12	0	0

	Per	£	s.	d.	to	£	s.	d.		Per	£	s.	d.	to	£	s.	d.
Ammonia, anhydrous ..	lb.	0	1	8	to	0	1	10	Strontium carbonate ..	ton	55	0	0	to	60	0	0
Ammonia, .880 ..	ton	33	0	0	to	35	0	0	Strontium Nitrate ..	ton	45	0	0	to	47	10	0
Ammonia, .920 ..	ton	21	0	0	to	23	0	0	Strontium Sulphate, white ..	ton	6	10	0	to	7	10	0
Ammonia, carbonate ..	lb.	0	0	4	to	0	0	4½	Sulphur chloride ..	ton	25	0	0	to	27	10	0
Ammonia, chloride ..	ton	60	0	0	to	65	0	0	Sulphur, Flowers ..	ton	13	0	0	to	14	0	0
Ammonia, muriate (galvanisers) ..	ton	35	0	0	to	37	10	0	Roll ..	ton	13	0	0	to	14	0	0
Ammonia, nitrate (pure) ..	ton	35	0	0	to	40	0	0	Tartar emetic ..	lb.	0	1	6	to	0	1	7
Ammonia, phosphate ..	ton	78	0	0	to	80	0	0	Tin perchloride, 33% ..	lb.	0	1	2	to	0	1	4
Ammonia, sulphocyanide ..	lb.	0	1	10	to	0	2	0	Perchloride, solid ..	lb.	0	1	5	to	0	1	7
Amyl acetate ..	ton	175	0	0	to	185	0	0	Protochloride (tin crystals) ..	lb.	0	1	5	to	0	1	6
Arsenic, white, powdered ..	ton	42	0	0	to	44	0	0	Zinc chloride 102° Tw. ..	ton	21	0	0	to	22	10	0
Barium, carbonate, 92-94% ..	ton	12	10	0	to	13	0	0	Chloride, solid, 96-98% ..	ton	25	0	0	to	30	0	0
Barium, Chlorate ..	ton	60	0	0	to	68	0	0	Oxide, 99% ..	ton	36	0	0	to	38	0	0
Barium Chloride ..	ton	19	10	0	to	20	0	0	Dust, 90% ..	ton	45	0	0	to	47	10	0
Nitrate ..	ton	27	10	0	to	30	0	0	Sulphate ..	ton	18	10	0	to	19	10	0
Sulphate, blanc fixe, dry ..	ton	20	10	0	to	21	0	0									
Sulphate, blanc fixe, pulp ..	ton	10	5	0	to	10	10	0									
Sulphocyanide, 95% ..	lb.	0	1	0	to	0	1	3									
Bleaching powder, 35-37% ..	ton	12	0	0	to	—											
Borax crystals ..	ton	29	0	0	to	33	0	0									
Calcium acetate, Brown ..	ton	9	0	0	to	9	10	0									
Calcium Carbide ..	ton	13	0	0	to	13	10	0									
Chloride ..	ton	16	0	0	to	17	0	0									
Carbon bisulphide ..	ton	6	10	0	to	7	0	0									
Casein, technical ..	ton	50	0	0	to	52	0	0									
Cerium oxalate ..	lb.	0	4	6	to	0	4	9									
Chromium acetate ..	lb.	0	1	1	to	0	1	3									
Cobalt acetate ..	lb.	0	6	0	to	0	6	6									
Oxide, black ..	lb.	0	9	6	to	0	10	0									
Copper chloride ..	lb.	0	1	2	to	0	1	3									
Sulphate ..	ton	28	10	0	to	29	0	0									
Cream Tartar, 98-100% ..	ton	115	0	0	to	117	10	0									
Epsom salts (see Magnesium sulphate) ..	ton	68	10	0	to	70	0	0									
Formaldehyde, 40% vol. ..	lb.	0	2	6	to	0	2	9									
Formosul (Rongalite) ..	ton	6	10	0	to	6	0	0									
Glauber salts, commercial ..	ton	70	0	0	to	72	0	0									
Glycerine, crude ..	gal.	0	2	5	to	0	2	6									
Hydrogen peroxide, 12 vols. ..	ton	30	0	0	to	32	0	0									
Iron perchloride ..	ton	4	0	0	to	4	5	0									
Iron sulphate (Copperas) ..	ton	42	0	0	to	43	0	0									
Lead acetate, white ..	ton	42	0	0	to	46	0	0									
Carbonate (White Lead) ..	ton	46	10	0	to	48	10	0									
Nitrate ..	ton	35	10	0	to	36	0	0									
Litharge ..	ton	25	10	0	to	26	0	0									
Lithopone, 30% ..	ton	10	0	0	to	10	10	0									
Magnesium chloride ..	cwt.	2	10	0	to	2	15	0									
Carbonate, light ..	ton	8	0	0	to	8	10	0									
Sulphate (Epsom salts commercial) ..	ton	13	10	0	to	14	10	0									
Sulphate (Druggists') ..	ton	65	0	0	to	75	0	0									
Manganese, Borate, commercial ..	ton	60	0	0	to	62	0	0									
Sulphate ..	ton	60	0	0	to	65	0	0									
Methyl acetone ..	ton	65	10	0	to	66	0	0									
Alcohol, 1% acetone ..	ton	49	0	0	to	51	0	0									
Nickel sulphate, single salt ..	ton	51	0	0	to	52	0	0									
Ammonium sulphate, double salt ..	ton	33	0	0	to	34	0	0									
Potash, Caustic ..	lb.	0	0	6½	to	—											
Potassium bichromate ..	ton	31	0	0	to	33	0	0									
Carbonate, 90% ..	ton	12	0	0	to	12	10	0									
Chloride, 80% ..	lb.	0	0	4½	to	0	0	5									
Chlorate ..	ton	84	0	0	to	90	0	0									
Meta bisulphite, 50-52% ..	ton	45	0	0	to	47	0	0									
Nitrate, refined ..	lb.	0	0	9	to	0	0	10									
Permanganate ..	lb.	0	4	6	to	0	4	9									
Prussiate, red ..	lb.	0	1	3	to	0	1	3½									
Prussiate, yellow ..	ton	13	0	0	to	13	10	0									
Sulphate, 90% ..	cwt.	3	3	0	to	—											
Salammoniac, firsts ..	cwt.	24	10	0	to	24	15	0									
Seconds ..	ton	45	0	0	to	48	0	0									
Sodium acetate ..	ton	10	10	0	to	11	0	0									
Arseniate, 45% ..	lb.	0	0	5½	to	—											
Bicarbonate ..	ton	23	0	0	to	24	0	0									
Bichromate ..	lb.	0	0	3½	to	0	0	4									
Bisulphite, 60-62% ..	ton	22	10	0	to	23	0	0									
Chlorate ..	ton	25	0	0	to	25	10	0									
Caustic, 70% ..	lb.	0	1	9	to	0	2	0									
Caustic, 76% ..	ton	13	10	0	to	14	0	0									
Hydrosulphite, powder, 85% ..	ton	31	0	0	to	32	0	0									
Hyposulphite, commercial ..	lb.	0	0	11	to	0	1	0									
Sodium Nitrite, 96-98% ..	ton	18	10	0	to	19	0	0									
Phosphate, crystal ..	lb.	0	0	11	to	0	0	11½									
Perborate ..	ton	13	0	0	to	14	0	0									
Prussiate ..	ton	21	10	0	to	23	10	0									
Sulphide, crystals ..	ton	12	10	0	to	13	0	0									
Sulphide, solid, 60-62% ..	ton	12	10	0	to	13	0	0									
Sulphite, cryst. ..	ton	12	10	0	to	13	0	0									

Coal Tar Intermediates, &c.

	Per	£	s.	d.		£	s.	d.
Alphanaphthol, crude	lb.	0	2	3	to	0	2	6
Alphanaphthol, refined	lb.	0	3	0	to	0	3	3
Alphanaphthylamine	lb.	0	2	0	to	0	2	1
Aniline oil, drums extra	lb.	0	1	0	to	0	1	1
Aniline salts	lb.	0	1	1	to	0	1	2
Anthracene, 40-50%	unit	0	0	8½	to	0	0	9
Benzaldehyde (free of chlorine) ..	lb.	0	3	9	to	0	4	3
Benidine, base	lb.	0	5	9	to	0	6	0
Benidine, sulphate	lb.	0	5	9	to	0	6	0
Benzoic acid	lb.	0	1	7½	to	0	1	9
Benzoate of soda	lb.	0	1	6	to	0	1	7
Benzyl chloride, technical ..	lb.	0	2	0	to	0	2	3
Betanaphthol benzoate	lb.	0	4	9	to	0	5	0
Betanaphthol	lb.	0	1	4	to	0	1	4½
Betanaphthylamine, technical ..	lb.	0	6	0	to	0	7	0
Croceine Acid, 100% basis ..	lb.	0	3	6	to	0	3	9
Dichlorobenzol	lb.	0	0	9	to	0	0	10
Diethylaniline	lb.	0	2	9	to	0	3	0
Dinitrobenzol	lb.	0	1	3	to	0	1	4
Dinitrochlorobenzol	lb.	0	0	11	to	0	1	0
Dinitronaphthalene	lb.	0	1	4	to	0	1	5
Dinitrotoluol	lb.	0	1	5	to	0	1	6
Dinitrophenol	lb.	0	2	9	to	0	3	0
Dimethylaniline	lb.	0	2	3	to	0	2	6
Diphenylamine	lb.	0	4	3	to	0	4	6
H-Acid	lb.	0	6	6	to	0	7	0
Metaphenylenediamine	lb.	0	5	6	to	0	5	9
Monochlorobenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	6	0	to	0	6	6½
Monosulphonic Acid (2.7) ..	lb.	0	5	6	to	0	6	0
Naphthionic acid, crude ..	lb.	0	3	0	to	0	3	3
Naphthionate of Soda	lb.	0	3	0	to	0	3	3
Naphthylamin-di-sulphonic-acid ..	lb.	0	4	0	to	0	4	3
Neville Winther Acid	lb.	0	7	9	to	0	8	0
Nitronaphthalene	lb.	0	1	4	to	0	1	5
Nitrotoluol	lb.	0	1	0	to	0	1	2
Orthoamidophenol, base ..	lb.	0	10	0	to	0	10	5
Orthodichlorobenzol	lb.	0	1	0	to	0	1	1
Orthotoluidine	lb.	0	1	6	to	0	1	9
Orthonitrotoluol	lb.	0	0	10	to	0	1	0
Para-amidophenol, base ..	lb.	0	10	0	to	0	10	6
Para-amidophenol, hydrochlor ..	lb.	0	10	6	to	0	11	0
Paradichlorobenzol	lb.	0	0	6	to	0	0	7
Paranitraniline	lb.	0	3	6	to	0	3	9
Paranitrophenol	lb.	0	2	3	to	0	2	6
Paranitrotoluol	lb.	0	5	0	to	0	5	3
Paraphenylenediamine, distilled ..	lb.	0	10	6	to	0	10	9

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

GLASGOW, JUNE 13, 1922.

BUSINESS during the past week has been fairly satisfactory, inquiries, both home and export, being plentiful.

There is little change in values, and Continental quotations remain about the same.

Industrial Chemicals

ACID ACETIC.—Moderate inquiry for glacial. 98/100% quoted at £60 to £61 per ton; 80% B.P., £43 to £44; technical, £40 to £41.

ACID BORACIC.—Price unchanged. Crystal or granulated, £60 per ton; powdered, £62 per ton.

ACID CARBOLIC (CRYSTALS).—In little demand. About 6d. per lb.

ACID HYDROCHLORIC.—Unchanged, at 6s. 6d. per carboy ex works. Slightly better demand.

ACID OXALIC.—Moderate inquiry. 8½d. per lb.

ACID SULPHURIC.—144°, £4 per ton; 168°, £7 5s. per ton. De-arsenicated, £1 per ton more.

ACID TANNIC.—Powder, 81/83% is offered from the Continent at £11 3s. 6d. f.o.b.

ACID TARTARIC.—Spot lots available at 1s. 4½d. per lb.

ALUMINA SULPHATE.—Fair export inquiry. 14/15%, £8 5s. per ton; 17/18%, £10 per ton f.o.b. U.K. Continental offers slightly higher.

ALUM POTASH, LUMP.—Spot lots of Continental make, £15 5s. to £15 10s. ex store.

AMMONIA ANHYDROUS.—Little demand. 1s. 9d. to 1s. 10d. per lb. ex station.

AMMONIA LIQUID, 880°.—Quoted 3½d. per lb. ex works.

AMMONIA MURIATE.—Grey galvanisers' quality, £34 per ton f.o.r.

AMMONIA SULPHATE.—Moderate demand. 25½%, £15 10s. per ton; 25¾% neutral, £16 13s. per ton ex works, June delivery.

AMMONIA SALAMMONIAC (CRYSTALS).—Remains steady at £58 per ton.

ANTHRACENE, 58%.—Continental make is offered at 6d. per lb. c.i.f. U.K. port.

ARSENIC, WHITE POWDERED.—Price firm, at £44 per ton ex quay.

BARIUM CHLORIDE, 98/99%.—Fair inquiry for export. Quoted £21 per ton f.o.b. U.K. port.

BARYTES.—Price of English make unchanged. Finest white, £5 15s.; grey, £3 15s. ex works. Little inquiry.

BLEACHING POWDER.—Makers advise reduction of £1 per ton for July delivery. Spot lots, £14 per ton ex station.

BORAX.—Crystals or granulated, £29 per ton; powdered, £30 per ton. Usual local demand.

BROMINE, LIQUID.—Maximum 0.3% chlorine offered from the Continent at 6d. per lb. c.i.f. U.K. port.

CALCIUM CHLORIDE.—English make, £6 10s. ex quay. Continental offers of £5 15s. c.i.f., in casks.

COPPER SULPHATE.—Moderate inquiry. £28 per ton ex quay.

COPPERAS, GREEN.—Quoted at £3 15s. ex works, in full wagon loads.

FORMALDEHYDE, 40%.—In little request. Spot lots to be had at £67 per ton.

GLAUBER SALTS.—Fine crystals, £5 per ton ex store.

LEAD ACETATE.—Continental offers of fine white crystals at £37 10s. c.i.f. U.K.

LEAD, RED.—£36 10s. per ton. No change in price. Little demand.

LEAD, WHITE.—£50 10s. per ton. No change in price. Little demand.

MAGNESITE (GROUND CALCINED).—A few local inquiries. Price £12 10s. ex store.

MAGNESIUM CHLORIDE.—Continental offers of £6 per ton c.i.f.

MAGNESIUM SULPHATE (EPSOM SALTS).—Commercial, £7 10s. per ton. B.P. quality, £9 15s. per ton delivered. Quoted, £9 5s. for export.

POTASSIUM BICHROMATE.—Makers' price, 6½d. per lb. Spot lots on offer at 6¼d. per lb.

POTASSIUM CARBONATE, 88/92%.—Moderate inquiry. Quoted £29 per ton ex store.

POTASSIUM CAUSTIC, 88/92%.—Spot lots at £33 per ton ex store.

POTASSIUM CHLORATE.—On offer at 4½d. per lb.

POTASSIUM NITRATE.—Spot lots on offer at £35 per ton. Cheap Continental offers of £27 per ton c.i.f.

POTASSIUM PERMANGANATE.—In moderate request. Price 10½d. per lb. ex station.

POTASSIUM PRUSSIAN, YELLOW.—Inclined to be dearer at 1s. 4d. per lb.

PYRITES.—Spanish lump or small quoted at 16s. 6d. per ton f.o.b.

SODIUM BICARBONATE.—Price unchanged £11 per ton ex station. M.W. quality £10 per ton.

SODIUM BICHROMATE.—Makers' price 5½d. per lb. In little request.

SODIUM CARBONATE (SODA CRYSTALS).—£6 per ton ex quay or station.

SODIUM CARBONATE ALKALI 58%.—£9 12s 6d. per ton ex quay or station.

SODIUM CHLORIDE (COMMON SALT).—Continental make is offered at 12s. 6d. per ton f.a.s. Cadiz.

SODIUM CAUSTIC.—96/77%. £25 10s. per ton; 70/72%, £23 10s.; 60%, £26 5s.; 98/99% powdered, £29/30 per ton ex station. Fair demand for 76/77% for export.

SODIUM HYPOSULPHITE.—Pea crystals £20 10s. per ton. Commercial £14 10s. per ton ex store.

SODIUM NITRATE.—Ordinary quality £14 15s. per ton, f.o.r. or f.o.b. Refined quality £15 per ton.

SODIUM NITRITE, 100%.—Price firm at £31 per ton.

SODIUM PRUSSIAN YELLOW.—Inclined to be dearer at 10½d. to 11d. per lb.

SODIUM SULPHATE (SALTCAKE 95%).—Available for export at £4 per ton f.o.b.

SULPHUR.—Surplus Government stocks of Sicilian thirds £4 5s. to £4 15s. per ton according to quantity.

SULPHUR, ROLL.—For forward delivery quoted at £9 10s. per ton c.i.f.

TIN CRYSTALS.—Remains unchanged at 1s. 2½d. per lb.

ZINC SULPHATE.—Continental offers at £16 10s. per ton c.i.f.

ZINC CHLORIDE, SOLID.—Offered at £20 10s. per ton ex warehouse.

Coal Tar Intermediates and Wood Distillation Products

ANILINE, OIL AND SALT.—Home prices remain firm at 1s. and 1s. 1d. per lb.

ANTHRAQUINONE.—92/93% is offered from the Continent at 1s. 1d. per lb. f.o.b.

BENZOL.—There are liberal supplies on the market and pure benzol is offered at about 2s. 4½d. per gallon ex works.

BETA NAPHTHOL.—Export inquiries, price quoted 1s. 3d. per lb. f.o.b.

DIPHENYLAMINE.—Inquiries for export; price quoted 4s. 3d. per lb. f.o.b. Liverpool.

"H" ACID.—Inquiries for export; price firm at 6s. 9d. per lb. f.o.b. Liverpool.

PARAPHENYLENEDIAMINE.—Small home inquiries. Price quoted 9/6 per lb. delivered.

Operation of Anti-Dumping Provisions

THE Cabinet decided on Tuesday by a small majority to put into force the anti-dumping provisions of the Safeguarding of Industries Act in the test case of fabric gloves. The delay in the announcement of the Government's decision has been the subject of considerable criticism.

German Chemical Trade Notes

FROM OUR OWN CORRESPONDENT.

Berlin, June 12, 1922.

DURING the past week the chemical market has been affected not only by the usual post-holiday quietness, but also by the recent heavy fluctuations of the German mark, which on Saturday fell from 1,333 to 1,428 for sterling. On the whole the chemical market is not an active one as regards domestic consumers. The speculative element, however, always close followers of fluctuations in exchange rates, occasionally show a feverish activity, which generally dies down the following day, with a betterment of the mark.

As a tangible sign that German prices have surmounted the world's markets' levels, it is reported that in Hamburg considerable business has been done in English chemical products.

Export trade shows a tendency to slacken off; this is generally attributed to the operation of the "Aussenhandelsstellen." Potassium permanganate was almost the only product in request for export.

According to recently published statistics relating to the development of German chemical trade during May it appears that domestic trade in coal-tar dyes was equal to and perhaps slightly larger than in the previous month. There was little change in the exports of dyestuffs. Trade with the Austrian States, Holland and Scandinavia was about the same as in April, but in the latter country business has been somewhat restricted on account of illegally exported German dyes. The situation in Czecho-Slovakia is not particularly good, while orders for Finland were appreciably smaller. In a great many of the dye-importing countries German products are meeting with a strong foreign competition, particularly from Swiss makes.

The demand for pharmaceutical products shows a slight improvement, but business in photographic fine chemicals is very slack.

A slight improvement was noted in regard to supplies of raw materials. Supplies of fuel, barytes, etc., were sufficient to cover all requirements and benzol was available without restrictions as to quantity; soda, on the other hand, was still short. Difficulties were experienced by some manufacturers in obtaining glass carboys.

The market for coal-tar products is moving along active lines, and business generally is satisfactory.

The following quotations are given in marks per kilogram (d.=domestic price; e.=export price):—

Acids: Acetic, very scarce; 80%, chem. pure, 54 mk. d.; 58 and 60 mk. e.; 100%, 78 mk. d.; anhydride, 155 mk. d. Acetyl-Salicylic, 275/295 mk. d.; 375/395 mk. e. Benzoic, 160/170 mk. d.; 180/210 mk. e. Boric, 76.75/80.75 mk. d. Citric, 300 mk. d.; 310 mk. e. Formic, 85%, technical, in strong demand at 30 mk. d. Muriatic, scarce at 5.50 mk. e. Oxalic, 98/100%, is freely offered at 41 mk. d.; 68/70 mk. e. Salicylic, in fair request at 165/170 mk. d.; 105/210 mk. e. Sulphuric is off the market but in strong demand from inland and abroad. Tartaric, crystallised and powdered, 170/172 mk. d.; 185 mk. e.

INDUSTRIAL CHEMICALS: Alum: Chrome, 15%, 36/38 mk. d.; 40/42.50 mk. e.; Potash crystal powder, 9 mk. d.; 12 mk. e.; Potash, in lumps, 10/12.50 mk. d.; 13.50/14 mk. e. Alumina Sulphate, 14/15%, moderate request at 6.75 mk. d.; 8.75 mk. e.; 17/18% unchanged at 10.50 mk. e. Ammonia Carbonate, powdered, 20 mk. d.; 30/32 mk. e.; scarce in lumps, at 40 mk. e. Barium Chloride, crystallised, 23.50 mk. d.; 26 mk. e. Bleaching Powder, 110/115%, in good demand but scarce on spot; price 7.50/8 mk. d.; 14 mk. e. Borax, crystallised, 40 mk. d. Calcium Chloride, 70/75%, 6.75 mk. d.; 6.15 mk. e.; 90/95% material has met with active demand at 9 mk. d. Copper Sulphate, 98/100%, 38 mk. d. with moderate business passing; the export quotation of 40 mk. was of little interest to buyers. Formaldehyde, 30%, 65/69 mk. e.; 40%, 87 mk. e. Glycerine, chem. pure, 28° Bé., 93 mk. d.; 98 mk. e. Lead, red, in better demand at 41/42 mk. d.; some orders executed at 44/45 mk. e. Lead, white, in oil, 45.40 mk. d.; 47 mk. e.; dry, powdered, urgently offered at 40 mk. d., with no demand; small parcels were sold for Sweden at 43 mk. e. Lithopone, Red Seal, 30%, passing in small parcels at 23 mk. d.; freely offered for export at 25.50 mk., with no noticeable interest. Magnesium Chloride, fused, 2.75 mk. d.; 6/6.25 mk. e. Potassium Bichromate, 63/66 mk. d.; 80/83 mk. e. Potassium Carbonate, 96/98%, 27 mk. d.; 40 mk. e. Potash Caustic, 88/92%, 28 mk. d.; 37.50 mk. e. Potassium Chlorate, 32 mk. d.; 37 mk. e. Potassium Metabisulphite was in brisk demand at 50 mk. d.; 60 mk. e. Potassium Permanganate, 75 mk. d.; 78/85 mk. e. Potash Prussiate, yellow, 200 mk. d.; red, 420 mk. e. Salt Cake, offered urgently with weakening prices, 3.60/4.80 mk. d.; 6 mk. e. Soda,

crystallised, offered freely at 5.50/6.50 mk. d.; 7 mk. e. Soda Ash, 96/98%, is meeting with increased demand at 15/16 mk. d.; 14 mk. e. Sodium Bicarbonate is unchanged at 8.50 mk. d.; scarce for export at 18 mk. Soda Caustic, 125/128°, offered urgently (especially American material) at 30 mk. d.; 32 mk. e.; offerings in excess of demand; liquor, 12/14 mk. d. Sodium Silicate, 38/40° Bé., 3.25 mk. d.; 5 mk. e. Sodium Sulphide, 30/32%, freely offered at 10/11 mk. d.; 12 mk. e.; 60/62%, neglected at 22.50 mk. d.; 25.50 mk. e. Sulphur is showing a declining tendency and is freely offered in big lots from America and Italy. Zinc Chloride, 98/100%, 24 mk. d.; 26 mk. e. Zinc White in better demand; Red Seal, 48 mk. d.; 51 mk. e.; Green Seal, 55 mk. d. Anthracene Oil, 6.50/6.75 mk. d. Benzaldehyde, 175 mk. d.; 185 mk. e. Carbolinum, 6/6.50 mk. d. Creosote Oil, 6.50/6.75 mk. d. Naphthalene, pure, in balls, 19 mk. d.; 19.75 mk. e.; in flakes, 18.75 mk. d.; 19.50 mk. e.

The Nitrate Market

HENRY BATH AND SON, LTD., in their monthly report on nitrate of soda, state that May deliveries of nitrate in Europe were about 108,000 tons, against 48,000 tons in May, 1921, and demand from consumers has been moderately good, though interrupted towards the close of the month by dry and unusually warm weather. During the month fresh sales by the Pool were about 50,000 tons, and no new c.i.f. business was reported, nor anything for near arrival offered for sale. Spot prices on the Continent show some decline at about the parity of £14. Further sales for German consumption proved unfortunately to be impossible owing to the difficulty of payment in sterling. A moderate business has been transacted on the Continent in spring, 1923, delivery at the parity of about £12 10s. delivered. Prices of nitrogen products have again been raised in Germany. A further increase seems probable, owing to dearer railway freights in Germany. About the middle of May the United States Government made a fresh sale ex-war stock of 15,000 tons at what is reported to be the parity of about \$2.20 per 100 lb. in ports. The fixing of prices by the Producers' Association led with little delay to a fair amount of sales, which so far aggregate about 146,000 tons. The demand centred on early delivery, owing to its comparative cheapness and the risk of dearer freights ahead. A sale out of second hands is just reported from Chile of ordinary nitrate for September-December shipment at 9s. 1½d. per Spanish quintal. The cost of nitrate for July shipment f.a.s. Chile is now approximately only 12 per cent. higher than at this period in 1914, while nitrate freights for July loading are nearly 40 per cent. higher.

Death of Professor Gowland

WE regret to record the death, on June 10, at 13, Russell Road, Kensington, of Professor William Gowland, F.R.S., Emeritus Professor of Metallurgy at the Royal School of Mines. Born in 1843, he early became a student at the Royal School of Mines, and during his period there was awarded the Murchison and de la Beche medals. Leaving Kensington, he was engaged until 1872 with the Broughton Copper Co., Ltd., of Manchester. From 1872 to 1878 he acted as chemist and metallurgist to the Imperial Mint of Japan, and from 1878 to 1889 as Assayer, Metallurgist and Chief of the Foreign Staff, Osaka, Japan; another position which he held about this time was that of Adviser to the Imperial Japanese Arsenal. His work in Japan was recognised by the Emperor, who bestowed upon him the Order of the Rising Sun. Returning to England in 1890, he was for three years chief metallurgist to the Broughton Copper Co., Ltd., after which he was successively Examiner in Metallurgy to the Board of Education, External Examiner in Metallurgy and later Professor of Metallurgy to the Royal School of Mines, Governor of the Imperial College of Science and Technology, Governor of the School of Metallurgy and Mining, President of the Institute of Metals, and Emeritus Professor of Metallurgy at the Royal School of Mines. Professor Gowland was the author of a number of books, of which the best known is perhaps his *Metallurgy of the Non-Ferrous Metals*. He also contributed many papers to the technical journals.

The interment took place on Wednesday at St. Marylebone Cemetery, Finchley, London, and was attended by a large number of his colleagues and friends. Among those present were Professor Carpenter, Sir Thomas Holland, Professor W. H. Merrett, Professor Truscott, and Sir Thomas Rose.

Company News

BRITISH DYE STUFFS CORPORATION, LTD.—It is anticipated that the annual meeting will be held at Manchester on June 23.

SANTA RITA NITRATE CO.—The gross trading profits for 1921, including interest and transfer fees, were £29,662; the deduction of stoppage expenses, London charges and provision for Corporation Profits Tax, £12,041, leaves a net profit of £17,621. A dividend of 15 per cent., less tax, is recommended, and the balance carried forward. The accumulation of caliche was discontinued at the end of September last. The annual meeting will be held at Baltic House, 27, Leadenhall Street, London, on June 19, at 12.30.

SPICERS, LTD.—Arrangements have now been completed by which the business of Spicer Brothers, Ltd., is amalgamated with that of James Spicer and Sons, Ltd., under the style of Spicers, Ltd.

LAGUNAS NITRATE COMPANY, LTD.—Presiding at the annual meeting on Monday, Mr. R. E. Morris said that the gross profit of £40,470, although no nitrate was sold during the year under review, compared favourably with the average returns of previous years, and enabled the directors to recommend a dividend of 2s. per share, free of tax. They were compelled to close the oficina on March 31st, as it was evident that producers, owing to the large stocks in the hands of dealers, would not be able to make sales for many months.

HARRISONS AND CROSFIELD, LTD.—The directors announce a dividend on the cumulative preference shares at the rate of 6 per cent. per annum for three months to June 30, less tax at 5s. in the £, and dividend on the preferred ordinary shares at the rate of 10 per cent. per annum for the six months to June 30, less tax, at 5s. 6d. in the £. Warrants will be posted on June 30 to holders on the register at that date, including approved transferees in respect of transfers lodged at the company's office not later than June 15.

BURMAH OIL CO.—The recommendation of the directors regarding the final dividend on the ordinary shares for the year 1921 will probably be announced on or about June 28.

BORAX CONSOLIDATED, LTD.—The transfer books will be closed from June 21 to 30 inclusive, for the preparation of the warrants for the half-yearly interest due on July 1. Coupon No. 46 of the Debenture Stock Warrants to Bearer will be paid, less income tax at 5s. 6d. in the £, on and after July 1, at the offices of the company, 16, Eastcheap, London.

YORKSHIRE DYEWARE AND CHEMICAL CO., LTD.—The trading for the year ended March 31 resulted in a surplus of £16,020 (against £19,629), and £8,764 was brought forward. A final dividend is proposed at the rate of 12½ per cent., making 15 per cent., less tax, for the year (the same), and £5,443 is carried forward.

UTAH COPPER CO.—The report for 1921 states that the plants were closed down on April 4. The net earnings were \$257,901, and miscellaneous income amounted to \$524,186, making a total income of \$782,088, or 41 cents per share (against \$3.03). Against this there has been charged a total of \$2,840,197, resulting in a net decrease in surplus account of \$2,058,109. Disbursements were made to stockholders aggregating \$2.50 per share.

NEW TRANSVAAL CHEMICAL CO.—The transfer books will be closed from June 20 to 30 inclusive.

EGYPTIAN SALT AND SODA CO.—The 5 per cent. first mortgage debenture Coupon No. 40, due on June 30, will be paid on and after that date by the National Bank of Egypt, 6 and 7, King William Street, London. Talons attached to the above bonds will be exchanged for a further issue of Coupons, numbered 41 to 60 inclusive, on presentation to the bank on and after June 30.

UNITED INDIGO AND CHEMICAL CO.—A dividend is announced on the preference shares at the rate of 5 per cent. per annum, less tax at 5s. 6d. in the £, for the six months to June 3.

SCOTTISH OILS, LTD.—The report states that the credit balance, including £2,615 brought in, and after providing for depreciation, is £103,484. The available balance is £90,880, and the directors recommend a final dividend on the participating preference shares for the six months to March 31 last at the rate of 7 per cent. per annum, less tax, carrying forward £18,279.

The Late Sir J. Brunner

Memorial Statue Unveiled at Winnington

AT Winnington, Northwich, on June 10, Sir Alfred Mond unveiled an imposing statue of the late Sir John Brunner. Designed by Sir W. Goscombe John, the monument is nearly 16 ft. high, the figure of Sir John Brunner being of bronze, 8 ft. high, on a pedestal of granite. It represents him with his right hand extended in the attitude he assumed when addressing an assembly.

Mr. Roscoe Brunner presided, and in addition to members of the family he was supported among others by Lord Leverhulme, and by representatives of the United Alkali Co., Ltd., the Salt Union, the Castner, Kellner Co., Electro-Bleach and By-Products, Ltd., Chance and Hunt, Ltd., Lever Brothers, Ltd., Joseph Crosfield and Sons, Ltd., William Gossage and Sons, Ltd., Buxton Lime Firms, Ltd., Synthetic Ammonia and Nitrates, Ltd., and the directors, works managers, staff, etc., of Brunner, Mond and Co., Ltd. Amongst the letters of apology read by Mr. Brunner were those from Mrs. Ludwig Mond, Mr. Robert Mond, Mr. G. H. Cox (chairman of the Salt Union), the Registrar of the Liverpool University, Sir Arthur Crosfield, and the Right Hon. G. W. Balfour.

Sir Alfred Mond, unveiling the statue, said a large proportion of his life had been spent in the Brunner, Mond works. Not satisfied with merely being the creator of one of the greatest industrial firms in the country, Sir John Brunner devoted himself to that public service, both locally and nationally, in which he did such great work and had held such a distinguished position. The keynotes of his character were optimism, courage, and idealism, and those great qualities supported him and those who worked with him throughout the whole of his life. Wise men were always optimists, and would always remain optimists however black the sky might be, and all history had taught them that the progress of the human race was with those who never despaired of the future. The same qualities of courage and idealism animated Sir John in his political life. He was far in advance very often of the rest of the people in his ideas—a prophet who lived to see many of his prophecies realised, a man who unremittently gave his work, his time, and his money to the promotion of educational ideals which to-day were much more generally recognised. He was glad to think that the firm which bore his name had not ceased to follow in the tradition Sir John so wisely set.

Brunner, Mond and Co., Ltd., was not merely a money-making machine, it was a great national asset, a great creation of industry, a development and pride to this country and to those who worked with the founders by whom they were regarded as partners in their great enterprise. In that spirit he was certain the future of the undertaking lay.

After the statue had been unveiled, Mr. Louis Solvay said that Dr. Mond and Sir John Brunner were, to an extraordinary degree, complementary one with the other. One had the qualities of the inventor and the highest technical ability, all of which he applied, and the other possessed a fine spirit of discrimination, a most perfect foresight, and the master faculty of creating and organising the various departments relating to the financial and commercial administration of the company. Their association had brought about the gigantic and harmonious whole, Brunner, Mond and Co., Ltd., whose industrial and financial strength, whose scientific initiative, whose thorough understanding of matters relating to social welfare was universally acknowledged.

Expressing his thanks to Sir Alfred Mond and the directors of Brunner, Mond and Co., Ltd., who had provided the statue, Sir John Brunner remarked that in business and in politics his father had a passion for improvement as evidenced in the Liverpool University and the local schools. At an early stage in his public life he determined not to take office but to try to attain to that position which was attained by so very few—that of a great private member. As a party leader he was called to the chair as a matter of course, and they could say of him he had the affection of his friends and the respect of his opponents. To the end he retained a freshness of outlook and an optimism which should be an example to all who followed after. To sum up his character, he was a man imbued by high idealism, which was never, however, divorced from a shrewd appreciation of what was practically attainable.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

STANSFIELD, J. L., Boothfield, Waterfoot, chemical manufacturer. £29 6s. March 31.

WEATHERLEY, Cecil Octavius, 79, Fortress Road, London, chemist. £10 11s. 6d. April 13.

Mortgages and Charges

[NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]

CARTER (A. H.), LTD., Bristol, fertiliser specialists, etc.—Registered May 30, £5,000 debentures; general charge. *—November 7, 1921.

MAYMORN CHEMICAL CO., LTD., Liverpool.—Registered May 30, £1,400 mortgage, to R. F. Frazer, Liverpool, C.A.; charged on 52A and 52B, Great Crosshall Street, Liverpool. *—December 31, 1920.

Satisfactions

HEDLEY (THOMAS) AND CO., LTD. (late THOMAS HEDLEY AND CO. (1905), LTD.), Newcastle-on-Tyne, soap makers.—Satisfaction registered June 6, £13,000, amount outstanding July 1, 1908.

IRON JELLOID CO., LTD., London, E.C., manufacturing chemists.—Satisfaction registered June 7, £10,000, registered October 27, 1920.

London Gazette

Companies Winding up Voluntarily

CHEMICAL AND COMMERCIAL TRUST, LTD.—Newman Ogle, Son and Co., of Spencer House, South Place, London, appointed liquidators.

HOLBORN GLASS WORKS, LTD.—M. Stainton, 18, Grainger Street West, Newcastle-upon-Tyne, and C. S. Blackwood, 70, King Street, South Shields, appointed liquidators.

Bankruptcy Information

MASON, Daniel William, Mason's Cash Drug Stores, 175, Parc Road, Cwmparc, Glamorgan, drug store proprietor.—Receiving order, June 3. Debtor's petition.

SEDDON, Percy, 32, Rochdale Road, East, and 30, Bridge Street, Heywood, Lancs, chemist.—Receiving order, June 6. Debtor's petition.

Recent Wills

Mr. James Stuart, of Bridlington, formerly in business as a seed crusher and oil refiner, and a member of the board of the British Oil and Cake Mills, Ltd.	£16,772
Mr. Harry George Hayward, The Beeches, Hanham, Glos., of Haywards (Chemists), Ltd., Bristol . .	£7,040
Mr. William Ross Hedges, Wake Green Road, Moseley, Birmingham, founder of Hedges (Chemists), Ltd., Birmingham	£92,737

New Companies Registered

ELDER DEANS, LTD., 142, High Street, Gosforth, Northumberland. Manufacturing chemists, etc. Nominal capital, £5,000 in £1 shares.

WRAY FERRIC OXIDE MINE, LTD., Moretonhampstead, Devon. To acquire the "Wray Ferric Oxide Mine," etc. Nominal capital, £4,000 in £1 shares.

BRITISH OIL IMPORTING AND REFINING CO., LTD. Oil producers, transporters, refiners, manufacturers, etc. Nominal capital, £10,000 in £1 shares. A subscriber: H. E. Warner, 1, Great Winchester Street, London.

A. ADAMS AND CO., LTD., 24, Charing Cross Road, London. Manufacturers of optical and scientific apparatus, etc. Nominal capital, £9,000 in £1 shares.

BRITISH RUSSIAN TRADE DEVELOPMENT ASSOCIATION, LTD., 58, Pall Mall, London. Manufacturers of chemicals, fertilisers, dyes, tanning extracts, etc. Nominal capital, £100 in £1 shares.

EMBROINT, LTD. Manufacturers of patent medicines, soaps, proprietary articles, etc. Nominal capital, £2,000 in £1 shares. A director: E. N. Guest, 80, Wardour Street, London.

H. FREESE, LTD. Wholesale manufacturing chemists, druggists, perfumers, soap manufacturers, etc. Nominal capital, £4,000 in £1 shares (1,000 6 per cent. cumulative preference). A subscriber: N. Freese, 59, Bermondsey Street, London.

FAX, LTD., 23 Canal, Salisbury, Wilts. Manufacturers of and dealers in drugs, perfumes, powders, etc. Nominal capital, £2,000 in £1 shares.

Contracts Open

Tenders are invited for the following articles. The latest dates for receiving tenders are, when available, given in parentheses:

BULGARIA (June 26).—Five hundred tons creosote and 50 tons zinc chloride. Particulars from Department of Overseas Trade (Room 52), 35, Old Queen Street, Westminster, London. (Reference No., D.O.T., 8269/F.E./C.P.)

SOUTH AFRICA (June 26).—Disinfectant powder (about 16,800 lb.). Particulars from Department of Overseas Trade (Room 52), 35, Old Queen Street, London. (Reference No., D.O.T., 8738/E.D./C.P.)

LONDON (June 23).—Sodium nitrate. Particulars from and tenders to Director-General, India Store Department, Belvedere Road, Lambeth, London.

CHESTER (June 26).—Drugs. Forms from and tenders to J. H. Dickson, Town Hall, Chester.

PENTRE (June 24).—Paints, oils, Portland cement, hydraulic lime, etc. Particulars from and tenders to Chairman, Council Offices, Pentre.

Chemical Merchants' Affairs

THE first meeting of creditors of F. Ford and Co., oil, colour and chemical merchants, Bush Lane House, Cannon Street, London, was held at Bankruptcy Buildings, Carey Street, London, on Tuesday. The debtor estimated his unsecured liabilities at £1,500, in addition to which there was a partly secured creditor for £14,000. The assets comprised book debts of the face value of £4,000, estimated to produce £300, and a motor car. Mr. F. S. Salaman, 1 and 2, Bucklersbury, London, was appointed as trustee in bankruptcy and a committee of inspection was also appointed.

At the Board of Trade offices, on Tuesday, a meeting of creditors and contributories of M. Mazza and Co., Ltd., Chancery Lane Station Chambers, London, was held, following a winding-up order made on the petition of R. L. Fuller and Co., Ltd., of Harp Lane, London, who were creditors for £10,621 in respect of quinine supplied. In a statement of affairs the unsecured liabilities were returned at £27,652, and there were also fully secured liabilities amounting to £5,275. The claims of partly secured creditors totalled £1,517, and there were preferential claims amounting to £5,676. The only assets disclosed were valued at £7. The liquidation was left in the hands of the Official Receiver.

